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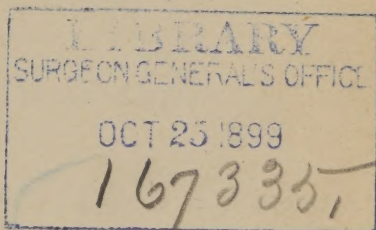
THIRD EDITION.

THOROUGHLY REVISED.

—BY—

CHARLES HAZZARD, Ph. B., D. O.,

Professor of Histology and Pathology, 1897-1898; Professor
of Principles of Osteopathy, 1898-99, in the American
School of Osteopathy and Member of the Staff of
Operators in the A. T. Still Infirmary,
Kirksville, Missouri.



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PREFACE TO THE SECOND EDITION.

SINCE the first appearance of this work, the course of lectures of which the first edition was composed, has been increased in number to forty-four.

The first edition contained discussions of theory, together with a review of the human body, part by part, with indications for Osteopathic examination and treatment of the same. The second edition contains in addition, lectures upon specific diseases, with descriptions of the Osteopathic method of examination and treatment of the same. A limited number of cases has been thus treated, the idea being not to make this volume a Practice of Osteopathy, but to show the method employed in diagnosis and treatment of the several different classes of cases that the Osteopath meets in daily practice. For example: acute conditions, such as typhoid fever, diarrhœa, and the like, and on the other hand, chronic affections, such as spinal curvatures, constipation and other complaints of a similar nature, have been dealt with.

To this there have been added a few lectures upon the History of Medicine, Massage, etc., in order that the student may know the principles of such systems, and learn to point out the independence of Osteopathy from them.

CHARLES HAZZARD.

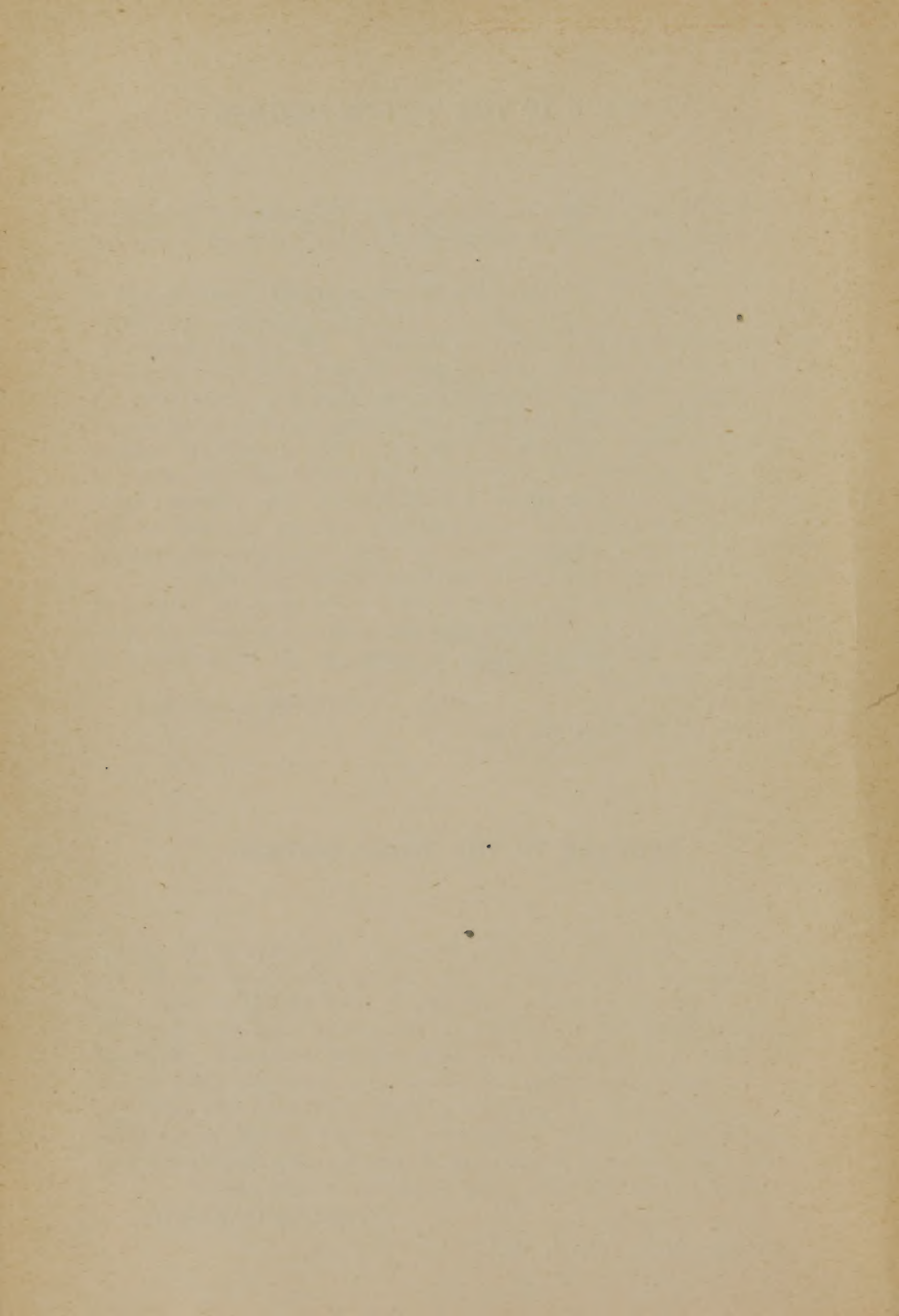
Kirkville, Mo., Jan. 30, 1899.

PREFACE TO THE THIRD EDITION.

Owing to the largely increasing interest in the science of Osteopathy, its great success as a healing art, the opening of many schools for the teaching of the science, and the flocking to these schools of scores and hundreds of young men and women, the two previous editions of this book—Principles of Osteopathy—have been quickly exhausted. Repeated orders for the book reaching the author have made this third edition imperative at this time. The revision of these lectures has been thorough; the lectures on the History of Medicine have been omitted, as not being considered germane to the subject, and an appendix containing observations and facts of interest and value to the profession has been added.

CHARLES HAZZARD.

Detroit, Mich., Aug. 1, 1899.



Principles of Osteopathy.

PART I.

LECTURE I.

I. GENERAL CONSIDERATIONS.

Learn to treat understandingly; imitate no operator's motions. Emerson says, "Imitation is suicide." Take for instance a case of erysipelas. Should the operator treat about the sore spots, occurring usually on one side of the face near the ear, and treat there alone, without giving attention to the general condition of the patient, taking into account the affections of the kidneys, liver and other organs in this trouble, he would certainly not meet with success. One must understand the nature of the disease which he is treating.

Make a correct diagnosis of the case. There are no two cases alike. You cannot take it for granted that one case which you receive today is like the case which you treated yesterday. Look over the case thoroughly, making an individual diagnosis for it; likeness and unlikeness to other cases are incidental only. Make no diagnosis by telephone, as I knew a physician—a fellow townsman of mine—to do once. Remember that a young doctor's success often depends upon how he handles a simple case, for instance headache, which although not always simple, is frequently so. Should you be called first to treat a case of headache, and treat it successfully, granting it was a simple case, your future success in that town in which you may be located, may depend on that. I may cite here an incident told of Thoreau. It is said that, traveling on a train one day, he had occasion to lower the car window; soon thereafter he was accosted by a manufacturer traveling upon the same train, who said that he had noticed his delicate manipulation of that window and upon the strength of that observation offered him a position in his factory:

Have your theories but stick to facts. Remember that you cannot always treat a case according to preconceived theories—that each case is peculiar to itself. Huxley says, "Theories do not alter facts, and the universe remains unchanged, even though texts crumble."

II. GENERAL CONSIDERATION OF THE SPINE.

ORIGIN OF THE SPINAL NERVES (Holden): "The origin of the eight cervical nerves corresponds to the interval between the occiput and the 6th cervical spine.

"The origin of the first six dorsal nerves corresponds to the interval between the 6th cervical and the 4th dorsal spines.

"The origin of the lower six dorsal nerves corresponds to the interval between the 4th and 11th dorsal spines.

"The origin of the five lumbar nerves corresponds to the interval between the 11th and 12th dorsal spines.

"The origin of the five sacral nerves corresponds to the last dorsal and first lumbar spines."

LANDMARKS ALONG THE SPINE: Holden instances a median furrow caused by the prominence of the erectors spinæ, which extends along the spine as far as the interval between the 5th lumbar vertebra and the sacrum. Hollows upon the surface correspond generally to prominences of the skeleton, and vice versa. This is on account of the attachments by tendons to prominent skeletal points. Sharp friction will redden the spines of the vertebræ so that they can be counted, and one can notice whether they are in line or not. }

The level of the 3RD dorsal spine is the level of the root of the spine of the scapula.

The level of the 7TH dorsal spine corresponds to the inferior angle of the scapula.

The level of the 12TH dorsal spine corresponds to the head of the last rib.

The level of the 3RD intercostal space corresponds with the root of the spine of the scapula.

The level of the 3RD dorsal spine corresponds with the 3d intercostal space.

The level of the 3RD intercostal space corresponds with the level of the right and left bronchi, the right being nearer the posterior chest wall.

The following is a convenient method for ascertaining the position of the 12TH dorsal spine: Have patient fold his arms and lean forward, thus bringing the spines of the vertebræ out prominently; then the lower border of the trapezius muscle can be traced to the 12th dorsal spine.

The KIDNEY is best reached by pressure below the level of the last rib at the outer edge of the erector spine.

The TIP of the crest of the ilium is about the level of the spine of the 4th lumbar vertebra.

The ILIO-COSTAL SPACE extends from the lower border of the 12th rib to the crest of the ilium, varying in width from the breadth of a finger

to that of a hand. So says Holden. I would caution you, however, in the former case to ascertain carefully whether or not there be a drooping of the ribs and alteration of the chest in its antero-posterior diameter. Such a condition, a narrow ilio-costal space, is usually accompanied by neurasthenia and kindred affections.

In the DEPRESSION below the occiput are found the edge of the trapezius muscle and the upper end of the ligamentum nuchæ.

The 2ND cervical spine is forked and rather prominent. The 3RD, 4TH and 5TH cervical spines are not usually made out, as they recede anteriorly from the surface. The 6TH and 7TH (*prominens*) are prominent. The spines of the dorsal vertebræ correspond with the heads of the ribs next below, e. g.; the 4th dorsal spine with the head of the 5th rib. But the 11th and 12th dorsal spines correspond with the heads of those ribs.

III. ILLUSTRATIONS UPON THE SPINE.

In LOCATING THE ATLAS, it is felt only by making out its transverse processes, which are readily felt on each side between the mastoid process and the angle of the inferior maxillary bone; the normal position being about midway between these points on either side. Should there be a deviation from the normal, either to one side or the other, anteriorly or posteriorly, or a twist in either direction, it is readily made out by the educated touch.

PECULIAR VERTEBRÆ are found along the spine, viz.: the 2nd, 6th and 7th cervical, 12th dorsal and 5th lumbar. The 2nd cervical is noticeable because of being slightly prominent and bifid; the 6th and 7th cervical because of slight prominence; the 12th dorsal because it often marks what the Osteopath calls a "break," a separation of the spines of the vertebræ occurring between the 12th dorsal and 1st lumbar. This is a point of importance. The same is the case with the 5th lumbar, there often being a break between its spine and the superior crest of the sacrum.

The LIGAMENTUM NUCHÆ is of great importance to the Osteopath. You will remember that it extends from the occipital protuberance to the 7th cervical spine. You must learn to recognize it by touch. Frequently it will contract and is the sole means of relieving headache when stretched.

HOW TO EXAMINE A SPINE.*

In the first place, notice if at any point along the spinal column the spine of any vertebra is DEVIATED Laterally. In such a case there is usually

*See Appendix I.

a sore spot in the muscles upon the side of the spine toward which it is deviated. In the neck we do not depend upon the prominences of the spines behind to diagnose a slip in the vertebræ, but by turning the head to one side, thus bringing into prominence the articular processes of the vertebræ, we may ascertain whether or not one is prominent anteriorly, posteriorly, or laterally. In such a case a sore spot usually is found at the articular process of the vertebra. SPINES MAY BE SEPARATED at any point along the column; you may find the spines abnormally far apart. We occasionally find what is designated a SMOOTH SPINAL COLUMN, by which I mean that a spinal column may have its vertebræ so protected by the thickening of the ligaments or other structures as to obviate the ordinary feeling one experiences in passing the hand down the spine. For such a condition I have somewhat arbitrarily adopted the term, "a smooth spinal column." The NATURAL CURVES OF THE SPINE MAY BE CHANGED, as will readily be observed in practice. I do not speak here of spinal curvatures, not at all; but frequently a slight, or it may be a marked, deviation from the natural curve described by the normal spinal column, will be noticed. If there is a break, LIGAMENTS OFTEN CAUSE LESIONS in that they may, by the displacement of the bony parts to which they are attached, be dragged across some important structure, such as a nerve or blood vessel, compressing it and abridging its function.

These points upon how to examine a spine will be continued in further lectures, and their significance to the Osteopath be fully considered at those times.

LECTURE II.

I. CENTERS OF THE SYMPATHETIC.

These centers are of vast importance to the Osteopath. Reasoning according to centers is frequently with him going from effect back to cause, and from periphery back to center. It instances one of his modes of thought, and to acquire this habit of mind is frequently the basis of our professional success. There is a given definite center for the activities of a given point or organ. For instance, there is a center for which we work to affect the kidneys; or, we may say, there is a given definite center for each physiological process. As for instance, there is a center upon which we work to affect the general circulation. In the absence of a discoverable lesion, which frequently occurs, the Osteopath's work must be largely on the centers, sometimes entirely so. Even when the lesion has been found and attended to, he must give much attention to the particular center governing the part affected. It is

going back to first principles. The following points have been gathered from various sources; from the experience of operators, from lectures, from books, and from my own personal experience. I speak of the centers more in an Osteopathic than in a purely physiological sense, meaning that point along the spine which has designated itself as a center in response to the work upon it; results justify such statements. In other cases these so-called centers are the physiological centers indicated by the authorities.

CENTERS OF THE SYMPATHETIC:

THIRD CERVICAL vertebra, middle of neck. Above manipulate upward; below manipulate downward.

THIRD, fourth and fifth cervical, origin of the PHRENIC—hiccoughs.

THIRD, fourth, fifth and sixth, vaso-motors. The SUPERIOR CERVICAL GANGLION is connected with the first to fourth cervical nerves, lying opposite the second and third cervical vertebrae. The MIDDLE CERVICAL GANGLION is connected with the fifth and sixth cervical nerves, lying opposite the sixth and seventh cervical vertebrae.

The point between the first and second dorsal vertebrae, the center to the LUNGS.

First rib for the HEART.

Between second and third dorsal, CILIARY CENTER, and recti of eye-ball.

Between fourth and fifth dorsal on right side for the STOMACH CENTER; on the left, pneumogastric for the PYLORIC ORIFICE.

Fifth and sixth dorsal, VASO MOTORS to the arm.

Fifth, sixth, seventh and eighth dorsal, GREAT SPLANCHNICS.

Eighth dorsal, center for CHILLS.

Ninth, tenth and eleventh dorsal, SMALL SPLANCHNICS.

Twelfth, SMALLEST splanchnic.

From a point between the seventh cervical and first dorsal to a point between the eighth and ninth dorsal, the center for the anterior dorsal branches, which convey dorsal branches to PULMONARY PLEXUS. The posterior pulmonary plexus connects with the second, third and fourth ganglia of the sympathetic. The anterior pulmonary plexus is from the pneumogastric and sympathetics. VASO MOTORS TO THE LUNGS have been found in the dog from the second to the seventh dorsal. This corresponds to the centers upon which we work in man to reach the lungs.

Second lumbar vertebrae, center for PARTURITION, MICTURITION, DEFECATION.

Third lumbar, COELIAC AXIS.

Point between fourth and fifth lumbar vertebrae, DEFECATION.

Fifth lumbar, center for HYPOGASTRIC PLEXUS.

From a point between the second and third sacral to a point between the fourth and fifth sacral, center for the NECK OF THE BLADDER.

Fourth sacral, center to RELAX VAGINA.

Fourth sacral, SPHINCTER ANI (the latter two are spinal branches).

The term "CERVICAL BRAIN" has been applied by Dr. Still to the region lying between the first cervical vertebra and the fourth dorsal vertebra. The term "ABDOMINAL BRAIN" has been applied by him to the region lying between the first dorsal and third lumbar vertebrae, "PELVIC BRAIN," to that region lying between the tenth dorsal and fifth lumbar vertebrae.

Other centers of the sympathetic are as follows:

SENSATION, atlas to fourth dorsal.

MOTION, fourth dorsal to sixth dorsal.

NUTRITION, sixth dorsal to coccyx.

These three centers are spoken of by Dr. Still.

CENTERS IN THE MEDULLA as follows: Cough, sneeze, vomit, respiration, salivation, phonation and deglutition, renal center, center for spasms.

VASO MOTOR CENTERS: Medulla, second to sixth dorsal, fifth lumbar.

CILIO-SPINAL center, fourth cervical to the second or fourth dorsal.

HEART center, in the corpora striata; first rib; first, second, third, fourth and fifth dorsal vertebrae.

CERVIX UTERI, ninth dorsal.

BLOOD SUPPLY TO OVARIES, eleventh dorsal.

UTERUS, second lumbar, second and third sacral vertebrae, also hypogastric plexus by the lower dorsal and four upper lumbar nerves, and through the splanchnics.

VASO MOTORS OF THE HEAD: The eye, ear, salivary glands, tongue, brain, etc., are all reached at the superior cervical ganglion. Here also a general vaso-motor effect to the body is claimed. *Vaso constrictors* for the head are said to exist at the fifth and sixth dorsal vertebrae. Stimulation of the superior cervical ganglion has a vaso constrictor effect upon the vessels of the retina, probably through its ascending branch and its connection with the fifth nerve.

The LUNGS, second to seventh dorsal vertebrae.

JEJUNUM, first to fifth dorsal vertebrae.

SMALL INTESTINE, above first lumbar.

LARGE INTESTINE, first to fourth lumbar.

LIVER, the splanchnics, vagi, and inferior cervical ganglion.

KIDNEYS, the sixth dorsal, second lumbar, renal splanchnics and superior cervical ganglion.

SPLEEN, splanchnics on the left side; eighth to twelfth dorsal.

LOWER LIMBS, second dorsal down.

CIRCULATION, superficial fascia (the second dorsal for the upper part of the body, the fifth lumbar for the lower part).

VALVES OF THE HEART, second to fourth dorsal.

RHYTHM OF THE HEART, third and fourth cervical.

The GENITO-SPINAL center and lower hypogastric plexus and plexus to intestinal canal, bladder and vasa deferentia, at the fourth and fifth lumbar.

BOWELS (peristalsis), ninth, tenth and especially the eleventh dorsal.

LARNYX, first, second and third cervical.

III. HOW TO EXAMINE A SPINE.—(*Continued.*)—LOOK FOR THE LESION always. It may be high above or much below the usual center. For instance, we may work as high as the lower dorsal for sciatica, its center being in the sacral plexus. This lesion may be in the nature of a strain, congested muscle, a dragging of ligaments, or a tightening of the ligaments, thus drawing the vertebræ together. It may be in the nature of a sprain or break. It may even be undiscoverable. But remember that your duty is not done until you have thoroughly looked for the lesion. A CONGESTION OF THE SPINAL MUSCLES is often noticed on examination; it may be of the superficial muscles or of the deep muscles; it may be primary or secondary. By PRIMARY, I mean a congestion of the muscles set up by some direct effect upon them, e. g.; the effects of a draft or a blow. This congestion involves the peripheral termination of the spinal nerves, acting through them and through their sympathetic connections to affect some internal viscus. By SECONDARY, I mean the reverse, for example, the stomach may be affected, and the affects may be transmitted over the solar plexus, back along the splanchnics, thence to the spinal nerves with which the splanchnics are connected, thence back over the peripheral terminations of these nerves to the skin and muscles of the back. You may, in your examination of the spine, find that it is frequently RIGID, not pliant; on the other hand, you may find that it is quite RELAXED; abnormally mobile.

LECTURE III.

I. FURTHER CONSIDERATION OF THE SYMPATHETIC SYSTEM:—I have already spoken of the importance that we as Osteopaths attach to centers, especially to those centers which I have given you along the spine. The theory of our work upon them and their significance in connection with disease we shall take up later. I may, in passing, say that they are one of the most important things by which the Osteopath has to work. The same is true of the sympathetic system in general. The general anatomy of the sympathetic system is doubtless already known to you, but there are points which I wish to recall to your attention and cite you their significance from our standpoint.

POINTS FROM QUAIN:—The sympathetics are connected with the spinal nerves by white and gray *rami communicantes*. The white are *medullated* and pass from the spinal nerves to the sympathetic ganglia. Some white fibres pass from the ganglion to the efferent ramus. Some end in the ganglia; they may ascend or descend in the sympathetic cord to higher or lower ganglia, thus connecting with several, and being in this manner widely distributed to the sympathetics. The gray *rami communicantes* are *non-medullated*, or pale. They pass from the sympathetic ganglia back to the spinal nerves, the reverse of the white. They arise from cells in the sympathetic ganglia. They may, rarely however, run in the sympathetic cord to another ganglion, and then emerge to take their course to the spinal nerves. They enter the anterior primary division of the spinal nerves, divide to send some fibres centrally toward the cord, some peripherally through the spinal nerves to the general system. Those gray fibres of the sympathetic which pass *CENTRALLY* join in part a *recurrent branch* of the spinal nerve and with it run to supply the vertebræ, the dura mater, the ligaments and blood vessels of the spinal canal. Other filaments pass over the bodies of the vertebra and supply the intercostal and lumbar arteries and veins, ligaments and bones. Thus, the central distribution of the sympathetic nerve is of great importance to the Osteopath in his work of building up a weak or defective spine, and helps to explain the wonderful results he obtains in that department of his work. Those sympathetic fibres which pass *DISTALLY* in the anterior and posterior primary divisions of the spinal nerves supply the blood vessels of the body walls and muscles with *vaso-motor* fibres, the sweat glands of the skin with *secretory* fibres, and the hairs with *pilo-motor* fibres.

Here again the sympathetic system becomes significant from the Osteopathic point of view, and aids in explaining the reasons for the immediate results attained in keeping the skin, the so-called second lung, and superficial fascia in good working order. It is important in cases of blood and skin diseases and in fevers. The centers of the superficial fascia, you will remember, are the superior cervical ganglia, the 2d dorsal and the 5th lumbar. Doctor Still, who in the past few months has been making special studies upon this subject, attaches great importance to the superficial fascia.

Of equal importance, finally, are the *VISCERAL DISTRIBUTIONS* of the sympathetic nerves, there being efferent branches running forward from the sympathetic ganglion to the great pre-vertebral plexuses, the cardiac, solar, and hypogastric, so-called primary plexuses, and their secondary plexuses, e. g.; the phrenic, renal, spermatic, coeliac, superior and inferior mesenteric, aortic, hemorrhoidal, vesical, etc. Their importance to the Osteopath lies in the fact that through them he may regulate the actions

of the internal viscera to a wonderful degree. Thus we stumble onto the paradox that a man's internal, organic life may come under the control of another to a greater or less extent.

Some gray fibres pass from the ganglia out over the efferent rami. I have placed here on the board a diagram from Quain in which you note illustrated the points which I have brought out concerning the gray and white rami communicantes and their connections with the anterior and posterior divisions of the spinal nerves, their course toward the cord and also the efferent rami running outward to the great prevertebral plexuses. The MEDULLATED FIBRES, that is, those of the white rami, may be, 1st, *sensory*, running from the posterior root of the spinal nerve; 2nd, *vaso and viscero-constrictors*, from the 9th, 10th and 11th cranial nerves, and from the anterior and posterior roots of the spinal nerves, ending in the sympathetic ganglion, whence their action is carried out through pale fibres rising from cells in the ganglia. These fibres thus have become demedullated by passing through the sympathetic ganglia. They may be, 3rd, *vaso dilators and viscero inhibitors* from the anterior spinal roots, and from the 9th, 10th and 11th cranial nerves, passing through the sympathetic ganglia, not connecting with any nerve cells therein, and reaching the organ they supply as medullated nerves.

II. LANDMARKS. A tabular plan of the parts opposite the spines of the vertebræ. (*After Holden.*) Opposite 7th cervical spine, *apex of lung*, higher in females.

Opposite 3rd dorsal, *aorta reaches spine, apex of lower lobe of lung, angle of bifurcation of trachea.*

Opposite 4th dorsal spine, *aortic arch ends; upper level of heart.*

Opposite 8th dorsal spine, *lower level of heart; central tendon of diaphragm.*

Opposite 9th dorsal spine, *oesophagus and vena cava perforate diaphragm; upper edge of spleen.*

Opposite 10th dorsal spine, *lower edge of lung; liver comes to the surface posteriorly; cardiac orifice of stomach.*

Opposite 11th dorsal spine, *lower edge of spleen; supra-renal capsule.*

Opposite 12th dorsal spine, *lowest part of pleura; aorta perforates diaphragm; pylorus.*

Opposite 1st lumbar spine, *renal artery; pelvis of kidney.*

Opposite 2nd lumbar spine, *termination of spinal cord; pancreas; duodenum just below; receptaculum chyli.*

Opposite 3rd lumbar spine, *umbilicus; lower border of kidney.*

Opposite 4th lumbar spine, *division of aorta; highest part of ilium.*

APEX OF LUNG is most liable to disease; may be examined by percussion at external end of clavicle.

Angle of BIFURCATION OF TRACHEA is in some cases opposite the 4th dorsal spine. This angle corresponds in front with the junction of the first and second parts of the sternum. As to the KIDNEY, its upper border may be as high as the level of the space between the 11th and 12th dorsal spines. Its lower border may extend as low as the 3rd lumbar spine.

III. HOW TO EXAMINE A SPINE.—(*Continued.*)—I spoke in a previous lecture of variations of curves of the spine from the normal. A few more words concerning this. There may come to your notice in your examination of a spine a FLATTENING between the shoulders; on the contrary, the tendency there may be decidedly POSTERIOR. The same condition may prevail immediately below the shoulders about the middle of the back. You may have a posterior flattening of the LUMBAR region, which naturally, as you know, is curved anteriorly. But, on the other hand, you may have too pronounced a tendency anteriorly in this region. Again, you may have all of the normal curves of the spine lessened, leaving what we describe as a STRAIGHT SPINE. You will readily see that in such a condition the whole equilibrium of the body is more or less disturbed. You may find the SACRUM itself too prominent posteriorly, or too flat, thus increasing or diminishing the antero-posterior diameter of the pelvis. Finally, you may find that the coccyx has been bent to one side, in which case it may be the cause of piles; it may be bent forward, as frequently you will find, from horseback riding, etc. In such a case it may become a mechanical impediment to the passage of fecal matter, causing constipation. In calling your attention to these points in how to examine a spine, I have left aside the subject of their significance. That subject will be fully considered in later lectures.

LECTURE IV.

HOW TO EXAMINE A SPINE (*Concluded.*)

There are a few more points regarding the abnormal curves of the spine, which I think will be useful to you, flattening between the shoulders or posterior tendency there, and the posterior tendency that we frequently meet along the lumbar region or flattening there. Recall the different positions of the coccyx that we find upon examination, and the different positions in which we find the sacrum itself. There may be considerable variation in the curves of the spine, so that you may have quite a straight spine by the time you have looked over all the points. Hence the natural equilibrium may be destroyed.

There is one other point which you will probably find, and that is that a vertebra may not only be slipped from side to side, but by following the curve along the spine we may come to a vertebra extending backward—not only one or two, but several may be DISPLACED BACKWARD; or you may find a single one displaced ANTERIORLY. I treated a case in which one of the dorsal vertebræ was pushed anteriorly, effecting the kidneys. Thus lesion generally affects the center near which it occurs.

Hilton says that frequently he has found that a PRESSURE OF THE HEAD DOWNWARD on the spine, and then rotation from side to side will cause a sensation of pain in the cervical region, and will be evidence of disease there, when one has not been able to find it by other diagnosis. He has found that the general symptoms justified his locating the disease in the upper cervical vertebræ.

There is another point that is of importance to you, and you should understand it. As you work along the spine you may hear certain popping noises. You will find them all along the spine, sometimes on one side, sometimes on the other. Also when you are working on the neck, you may get a click. The patient may hear it when he is turning his head from side to side. Now the reason as to why you hear these noises along the spine is explained differently in the different regions. In the dorsal region there are three things that may move. The whole vertebra may be moved; there is inter-vertebral motion, but we do not get many of these noises from that cause, on account of the way they are bound together, being connected by inter-vertebral discs, with no synovial membrane. The second place in which you may get motion is between the head of the rib and its articulation with the bodies of the vertebræ and the inter-vertebral substances. Then in the third place, you have motion at the tuberosities of the ribs, where they articulate with the transverse processes of the next vertebra below. In the neck the only place you are liable to get a click is between the articular processes of the vertebræ. These noises in the spine are of much significance, you will meet them and must understand them.

II. OSTEOPATHIC SIGNIFICANCE OF POINTS OBSERVED IN EXAMINATION OF THE SPINE.

After understanding fully how to examine the spine, your next question naturally is, "When I have found these things along the spine, what is their significance?" If we do not know what they mean they are useless to us. When once you know the results of certain lesions it does not take you long to find the lesion. I have therefore for the present dropped the subject of the sympathetic nerve, and have decided to devote one or two lectures to the general consideration of the

OSTEOPATHIC SIGNIFICANCE of the points which we find in our examination of the spine. Remember that this cannot be given to you in full by lectures, and that you will recognize the full significance only in your practice. I can make it plainer later when we take up particular cases. What I want to do is to show you the significance of certain points, and to get you into the habit of osteopathic reasoning—to show you how we look at these things, and the process of thought followed.

The first point, then, is as follows: In general, a LESION along the spine, whatever its character, AFFECTS THE CENTER at which it occurs, and thus may affect cerebro-spinal life or sympathetic life, either or both; the former, if it is more superficial, in general, and the latter if it is deeper, in general. As to the character of the lesion, it may be of any form found in the examination of the spine. As to locality, it may be either superficial or deep. You may find along between the shoulders a flattening, which may extend as low as the 8th dorsal, and interfere with the centers of the stomach. If it be serious in character it will extend deep enough to affect the sympathetics, and thus organic life, and you will probably have stomach trouble. If it is not deep enough to affect the sympathetic life, it may affect the cerebro-spinal life and you will have a lame back; or if it is in the region of the 6th or 7th dorsal, pains may run around the ribs and meet over the pit of the stomach. The character of the injury may be such that it affects deeper structures, or it may have a more superficial effect.

The next point in osteopathic reasoning is the consideration of the amount or INTENSITY OF LIFE displayed in any given condition. This is an important point, and perhaps not clearly expressed, but I will try to make it plain to you. You may have a rigid spine, or you may have a relaxed spine. Now, in general, the process of reasoning which the osteopath uses is about as follows: The fact that the spine is relaxed shows a lack of nerve force, a lack of life there. On the other hand, if there is great tension along the spine, the spine is closely bound down and held together by the ligaments, so that you have a rigid spine with little motion, the reasoning would be that there had been an injury to the spine that had resulted in directing too much nerve force to that part of the body for a shorter or longer period of time, which resulted in throwing too much food supply there, causing a thickening of the ligaments binding the vertebrae together. Collaterally, when too much life was thrown to that part it was robbing some other point.

Take several illustrations to make this clear: You may have a tension in the spinal muscles. It may seem queer to you, or to your patients, for you to tell them that a muscle is contracted, congested or drawn, and has remained that way. It is hard to believe, but such is the fact. What does such a condition argue to your mind? Simply that

there is too great an amount of nerve force there, which, reacting upon the muscles, causes them to contract. In that case your nervous force is in the nature of a stimulation to those terminal sensory nerves. On the other hand, it may be secondary from the condition of an internal viscus. There may be some visceral disease, say stomach trouble, which would be reflected from the solar plexus out along the splanchnics to the spinal nerves, and through the spinal nerves to their destination. There may be a misdirection of nerve force, which is sent to the spinal muscles, and you have too great a supply of nerve force along the spine. We reason according to the amount of nerve force sent to these points. Again, when you make a digital examination of the rectum, you may find that there is some irritation which acts in the nature of a stimulation to the nerve force which supplies that rectal sphincter, and is causing it to contract. On the other hand, you will find in some examinations that there is no force whatever put forth, the sphincter is relaxed, and in such cases it is very likely that the patient is suffering from incontinence of fecal matter. In the one case there is too much nerve life, in the other too little. This may also result from visceral troubles. In a case of diarrhoea the Osteopath first examines to find some lesion along the spine at the 9th, 10th, or 11th dorsal, causing too much nerve force to be directed from the sympathetic system to the intestine, so that there is too rapid peristalsis and also too great a secretion of watery matter. There is too much nerve life there, or there could not be too much motion. On the other hand, in constipation, either something has happened to deaden the nerve force, or to disseminate nerve force to other parts of the body, so that you have too little left. You have not enough energy to pass the fecal matter along its course, and the result is a case of constipation. This is not a full explanation of all these cases, but I simply use them as illustrations. You will find this a valuable point in Osteopathic reasoning. In the former case the Osteopath adopts such measures as will disseminate the nerve force and equalize it throughout the body. In the latter case he directs his attention to a rational means of renewing the nerve force which is lacking at the point affected.

When you find upon examination that the SPINES are SEPARATED, what is your conclusion? Simply that some lesion has caused a relaxation. There is too little life, and hence a separation. This may impinge upon the nerve centers and there will be trouble according to the center over which the lesion has occurred. In a case of a "smooth spine," where every vertebra seems to be drawn down close to its fellow, there seems to have resulted a contraction of the ligaments connecting them, affecting almost all of the centers along the spine to a greater or less degree; there may result neurasthenia, a general lack of nutrition, general eye troubles, nervous troubles, circulatory affections, etc.

A **SPINE TWISTED** leads us to look at the center which is affected. This brings us to the tension on the ligaments which I have mentioned. When we have a case in which there is a twist of the vertebra, we reason from the position of parts as to what ligaments are affected. Suppose, for instance, that a vertebra is twisted so that a spine instead of being exactly in line, is turned towards the right, then what is the condition of the ligaments? The anterior and posterior ligaments along the bodies of the vertebra will be obliquely upon a tension, the supra-spinous and inter-spinous ligaments will also be upon a strain, the ligamentum subflavum on the left side will be tightened, and that on the right side tightened also; the inter-transverse ligaments on each side will be tight, and extend, one forward and the other backward. This is the method of reasoning you should adopt, and you should reason from the symptoms as to what nerves are affected. You will find that the ligaments may draw across nerves in such a way as to affect nervous life, either spinal alone or sympathetic through the spinal.

I mentioned along the spine certain peculiar vertebrae. In regard to the **SECOND CERVICAL VERTEBRA**, if you are a young Osteopath and examining your first patient, you will be sure to find something wrong with that vertebra. Bear in mind that it is not like the others, but has a prominent forked spine. You may make the same mistake with the **7TH CERVICAL**. You should acquaint yourselves with these natural conditions, so that you may judge correctly as to any change from the normal condition. Then bear in mind also that the **12TH DORSAL** and the **5th lumbar** are very apt to be points of mischief, and a separation is very likely to take place at those points. Between the **5th lumbar** and the sacrum is a point which is frequently affected and which makes a great deal of trouble. The **5TH LUMBAR** may be anterior or it may be posterior, and in such a case it depends upon your symptoms as to how you will diagnose your case. This may cause trouble with the viscera supplied by the sympathetic nerve, there may be uterine trouble, trouble with the generative organs of either sex, paresis, paralysis, or sciatica.

In these **VARIATIONS FROM THE NORMAL CURVES** of the spine, in general the signification to the Osteopath is as follows: If there is a flattening or posterior tendency between the shoulders, you will generally find that the patient has heart or lung trouble. You will expect to find some lesion there affecting those organs, which acts directly by impinging upon the nerves or by changing the position of the ribs. There may be a change in the first or second rib, causing heart trouble; of the 7th rib, causing asthma. You may have heart or lung trouble there, or if it is as low as the 8th dorsal you may have stomach trouble, or there may be renal trouble caused by a lesion as high as the 2nd dorsal, or sciatica as high as the 2nd dorsal. You must reason according to the centers affected.

If there is a change from the natural curve in the region of the splanchnics from below the shoulders to the first lumbar, then look for such troubles as intestinal affections, renal troubles. This same reasoning applies in general to the sacrum and coccyx. The coccyx may cause either mechanical troubles, such as piles and constipation, or sympathetic trouble and affect the internal viscera in that way.

The Osteopath finds the *ATLAS* of great importance to him in his work, for the reason that it may impinge upon certain nerves, and may affect spinal centers; or it may act in such a way as to deprive the brain of its supply of blood, and thus lead to results which are very significant to the Osteopath. It may act in such a way as to shut off the blood supply to the brain, and it may affect every center in the brain. Hence, you may find that your patient has been unable to speak for a long time, or has been unable to hear plainly, or he may have become insane. It may also impinge so much that it presses on the cord and robs it of its nutrition, so that there may follow various spinal troubles. It may press upon it on one side, causing hemiplegia, the patient having no use of one half of his body, the legs and arms being small in the case of a child where the development has been impaired. This is the Osteopathic way of looking at a case when you find that the first cervical has been slipped. I had a case of this kind not long ago. The result of a slipped atlas was that the child could not speak; it could say "Mamma," but everything else that it said was just a peculiar sound; it could not articulate except that single word. In addition to that its left side was paralyzed, or there was a paresis there; the child limped, the leg was short and the arm was drawn up. The whole trouble was really at the first cervical vertebra, which was slipped, affecting the spinal cord and the brain, either through its blood supply or directly by impingement.

What is the SIGNIFICANCE OF THE NOISES that we cause along the spine? Sometimes nothing whatever. You may find noises all along the spine in a man who is quite healthy. But on the other hand, it may have considerable significance, and this the Osteopath should always take into consideration. As I have explained, either the heads or tuberosities of the ribs may be slipped, or the position of the vertebra may be changed, or the articular processes may cause a great deal of trouble in the neck. The Osteopath, in thinking of these things, thinks of the normal anatomy of the part. He says, here is a point which may be subjected to a strain or twist, it can be extended or shortened to some extent, so that these are moveable points; and being points at which a strain may occur, are points which are liable to disease. You will find this of great significance in the etiology of spinal curvature. Along this line I will quote from Hilton. He says: "Diseases of the spine may begin in the vertebræ or in the inter-vertebral substances; I think on the whole, in the

inter-vertebral substances where it is joined to the vertebrae." His editor, Dr. Jacobs, says that his view is supported by the fact that the junction of a more with a less elastic body is the weakest spot and therefore receives the full effect of the strain. He instances the case of an atheromatous artery, the weakest portion is where the diseased wall joins with the more elastic substance of the healthy wall, and it is at that point that the real strain comes, and that an aneurism is likely to occur. Hence, as explained, here arises for the Osteopath the significance of a distorted vertebra, causing a slight irritation of the parts, throwing too much blood and nerve force and life there, and setting up some irritation, causing a thickening of the ligaments and perhaps a permanent injury to certain parts, especially the nerves.

The Osteopath realizes that the ILL EFFECTS OF INJURIES ALONG THE SPINE ARE NOT DEPENDENT UPON THEIR GREAT EXTENT. That is to say, you may have a very bad curvature of the spine which is congenital, or there may be a very bad curvature of the spine which had come on through years, without very serious organic trouble following. In such cases where the curvature has covered a very long period of time, or where a child has been born so, the parts become adapted to the variation from the normal, and such persons may go through life with good organic life. I have seen some cases of dwarfs or hunch-backs, who had very good health; and reasoning from the Osteopathic standpoint, we sometimes wonder why it is in such pronounced curvatures of the spine, the person does not have stomach trouble, bowel trouble, why the kidneys are not affected, and so on. On the other hand, you may have a man with a sound back, but who has a little twist of one vertebra, which may make him a great deal of organic trouble. So the Osteopath reasons not from the great extent of the departure from normal, but from the center affected, and from antecedent conditions. Hilton says that almost all diseases of the spine are the result of some slight strain or some slight accident, and that is what the Osteopath finds every week of his practice. A man will come into your office in trouble; you will find a spinal lesion. He knows he never fell, a horse never kicked him, or anything of that kind, but later he will come and tell you that he remembers some past injury. He has had some accident which he had overlooked, but which has caused some slight lesion of the spine, taking time to develop, but which has at last caused considerable trouble. Hilton also instances a very serious case in which the lesion of the spine was not discovered at all; it was only after the patient had been fourteen years a paralytic and died that post mortem revealed the fact that the 5th, 6th and 7th cervical vertebrae had been ankylosed. The fall which caused it was a fall of forty feet upon his back and neck; upon examination of the patient he was unable to find

any lesion in these parts at the time. So the lesion may not be discoverable.

Once more, Hilton says that he believes many cases of spinal diseases are due to a slight injury which has been overlooked, or to exercise persisted in after fatigue. A man falls down, says he has not been hurt, gets up and rubs himself to restore circulation, and thinks nothing more of it; but as Hilton says, very slight injury may cause very serious results, and the Osteopath has to take all these things into consideration, and reason accordingly.

LECTURE V.

At the last lecture I called your attention to how to examine the spine, concluding that subject. I also took up the Osteopathic significance of certain special points which we had before noticed in our examination of the spine. In general, a lesion affects a center over which it occurs. The Osteopath reasons from the amount or intensity of nerve force displayed at any point. Spines may be separate or approximated. I called your attention to the special vertebræ, the 2nd and 7th cervical, and lesion at the 2th dorsal and 5th lumbar, and instanced the results of such lesions. I called your attention to the displacement of the atlas, stating that it was of great significance to the Osteopath, as it may shut off blood supply to the brain and may impinge upon the cord, causing serious troubles. I also called your attention, finally, to the fact that the Osteopath does not measure the injury by its vast extent, instancing the case of the hunch-back with good organic health, *versus* the case of a man with a slight slip or twist of one vertebra having great trouble.

I wish to-day to continue this line of thought, taking up then, as the head of this lecture: The further consideration of the Osteopathic significance of points in diagnosis. I failed to explain fully to you the significance of the **CLICKING IN THE NECK**. From what I said you may have gathered the impression that it has no significance, or very slight, as those noises which occur lower in the spine. Such is not the case, however; if you hear the click, the reason is because something has shut off the blood supply, it may have been a little strain, a congestion of the muscles, anything that will produce a tension over the blood vessels, or affect their vaso-motor fibres, causing a contraction and shutting off the blood. This may prevent the right amount of lubrication being deposited in the synovial membrane between the articular processes of the vertebræ, hence you have the vertebræ too close together, and the patient in turning his head, or upon its being turned by the operator, elicits a click or

grating sound, and the patient wonders what this is. To you such noises are of considerable significance.

You may find it useful to consider the various troubles which you will find in your practice IN RELATION TO THE PLEXUSES from which they arise, and if you adapt yourself to the habit of thought, and at once think, when you see trouble in one part of the body, where it may have come from, what plexus is affected, and what region in the spine, I believe it will be of considerable use to you. Now, there may be LESIONS OF CERTAIN GROUPS OF NERVES,—the UPPER CERVICAL GROUP of nerves, those from the first to fourth inclusive, may be affected by spasms, neuralgia, or by paralysis, in general. I wish to call your attention to some points in relation to the distribution of nerves, and show you how important it will be to you as Osteopaths to have a knowledge which you can quickly call into use, of the distribution of the various nerves in the body. You may have a pain in the ear—the person whom it affects may describe it as ear-ache. If this ear-ache occurs upon the anterior pendulous portion of the ear, or upon the posterior aspect of the ear, you will have to refer that pain to the 2nd cervical nerve, which supplies those parts. If the ear-ache is in the canal of the ear, or the upper anterior portion of the ear, you will have to refer that trouble to the 5th cranial nerve. Hilton states how it was that he happened to find so definitely just how these nerves were distributed to the ear. The case was that in which an attempt had been made to cut a person's throat; the auricular branch of the second cervical nerve had been divided so that sensibility had entirely departed from the posterior and lower parts of the ear. By pricking very carefully over the whole surface of the ear he found just the distribution of the nerves. You may have the ear-ache and tooth-ache. And why? Simply because the 5th nerve supplying the auditory canal supplies also, by the superior and inferior maxillary branches, the teeth of the upper and lower jaws respectively. You may have ear-ache associated with disease of the anterior third of the tongue, because the 5th nerve, which supplies sensation to the anterior third of the tongue also supplies the auditory canal. Pain in the anterior lateral part of the scalp, over the temples, pain in the face, eyes, nose, tongue, or teeth, you refer to this same 5th cranial nerve. On the other hand, in case the pain is in the back of the scalp, we have two areas, one supplied by the great occipital nerve, and one by the small occipital branch of the 2nd cervical nerve. So it is that you have these areas of distribution given so that you can refer pains in a particular part to the origin of the nerves. Both the 5th nerve and these upper cervical nerves are readily accessible to the operator. You thus see what the significance of these things is to the Osteopath in enabling him to make a correct diagnosis. If he is not acquainted with the distribution of these nerves, he is not able to trace back and find the seat of the lesion. So it is

by following correctly the distribution of the nerves you may fit yourself to make a correct diagnosis.

In general the diseases which occur from lesions in the upper cervical region are such troubles as torticollis, troubles with the phrenic nerve—hiccough, neuralgia, and troubles of that kind. Of course the Osteopath finds trouble with the phrenic nerve lower than the upper cervical group, generally arising from the 3rd, 4th and 5th cervical. When an Osteopath meets such disease as crutch paralysis, or writer's, violinist's or pianist's cramp, he refers such cases to the plexus at some point, or to a lesion affecting it centrally. I remember a case of crutch paralysis which I treated. It was secondary from the use of a crutch, the crutch pressing upon the median nerve which comes from the inner and outer cords, thus affecting that nerve and consequently the thumb and first finger which are supplied by it. Learn, then, to reason as to which plexus is affected. Having known this and how to treat it, your diagnosis will be correct, and you will be able to go understandingly about what you are trying to reach.

Hilton considers diseases of the upper cervical vertebræ among the most serious which may affect the spine. I quote from him as follows: "No cases of disease of the spine are so immediately dangerous to life as those of the upper part of the cervical region, especially if situated between the first and second cervical vertebræ." The reason of this is the close proximity of the bones to the spinal cord. There is danger of rupture of the ligaments about the odontoid process of the axis, and in case this is ruptured or worn away by disease, the medulla may be impinged upon, thus affecting the centers located there, especially the center of respiration, and so cause death. He instances a case which I have thought would be useful to you. He had a case of a lady who was affected thus: She had pains upon the left side of her head at the back, pains behind the ear, and over the clavicle and shoulder, pains and muscular paralysis of the left arm and deeper pain in the neck, which became apparent by pressure of the head down upon the spine, and rotation. He found that about the 1st, 2nd and 3rd cervical vertebræ there was some tenderness slightly more marked on the left than on the right. He anticipated, that there was a history of some accident, but could find none, as the lady knew of no accident that had occurred. Her general health was very much affected; she was unable to work; for she had very sleepless nights, and her nervous system was very much affected. He diagnosed this case from the tenderness in the cervical region; he diagnosed it as a disease affecting the second cervical nerve, hence the pain is in the back of the head; as affecting the 3rd, hence its distribution, also as affecting those parts supplied by the nerves which go to make up the brachial plexus.

I bring this out to demonstrate the need of accuracy in diagnosis, the need of reasoning closely along the lines of distribution of nerves. In this case Hilton found that the urine was affected, that it was ammoniacal, and a less skillful physician would have treated the case for bladder trouble, as indeed often occurs. The point I wish to make is, that THE OSTEOPATH MUST NOT BE CARRIED ASTRAY BY GENERAL SYMPTOMS. So where you find foul urine, pain in the bladder, and things of that kind, you may be led astray; you surely will be if you are not one who knows his business. It is the dictum of one of the old schools, to "watch the symptoms carefully and treat them as they arise." And that has seemed to be the practice followed. But it does not need much reasoning to show you that should an Osteopath adopt such a course, he would rapidly become a failure in his chosen profession. There was a case here some time ago—a young man from Springfield, Ill., came here with one leg shorter than the other. He used crutches; he had a severe pain on one side of the knee of the affected limb. That man had traveled extensively seeking help. He had been massaged and treated in almost every conceivable way; had lived in the hospitals for months. But one day he said to the physician in charge, "How does it happen that that leg is shorter; what is the trouble with that knee?" "Well," he said, "the bones may be separated and the tibia may have been pushed up, thus shortening that limb." If I remember correctly, that case was cured practically in one treatment. I do not say this to illustrate our quick cures. The treatment was sufficient because the muscles had been massaged, and were softened and ready to be worked upon. The hip was set. I became acquainted with the young man later. I realized what it was to have the deformity cured. He had been treated for years for the knee, but the trouble was in the hip. This is almost a threadbare illustration of what Osteopathy does; but it illustrates my point perfectly. If you follow up the symptoms and treat them as they arise, you will land in obscurity. I do not wish to criticise any system of medicine, but from our standpoint it will not do for an Osteopath to work in that way. If he does, he is a poor Osteopath and does not understand what he is trying to do, and simply makes what Doctor Still calls an "engine wiper." He goes to the seat of pain, and not the seat of the trouble. He becomes a masseur, and, in his case, the criticism could justly be made, that Osteopathy is nothing but massage.

This same point was brought out some time ago. We mentioned two things that made up the success of the Osteopath. The first was in not being too rough in our treatment, but the one I want to call your attention to especially was that Osteopathy makes correct diagnoses. It goes back to the original cause, and does not depend upon symptoms merely.

I wish to call your attention to the following point: THAT PAIN UPON THE SURFACE OF THE BODY, NOT ACCOMPANIED BY ANY RISE IN TEMPERATURE, INDICATES A DISTANT ORIGIN OF THE TROUBLE, AND THAT TROUBLE IS USUALLY IN THE SPINE.

Hilton says that if this pain be upon the cutaneous surface, it will indicate spinal disease in every case. I have had a drawing put here showing "a" and "b," the distribution respectively of the 6th and 7th dorsal nerves. They meet over the pit of the stomach in the skin, and will refer a pain to that point. The patient thinks the trouble is there; his trouble is invariably at the spine. He, of course, will want you to treat the affected spot. There is a case on record of pain in the pubes and over the lower part of the abdomen. The physician finding the trouble in the lower part of the spine, it being associated with paralysis of the lower limbs, decided it was spinal trouble and rubbed an ointment on the spine. The patient thinking the symptoms should be treated, rubbed the ointment over the lower part of the abdomen, being paid for his interference by a great deal of smarting. He wanted to treat the seat of the pain instead the seat of the lesion. It is true that these pains are not mere happen so's. They depend upon a close connection, as in this case, of the nerves. His close connection may be either through the spinal nerves or it may be through the sympathetic system. You may have a pain at a part, which you may trace up through a nerve, back through the cord to the brain or center, down another nerve to the original cause; so that an original cause may act along a nerve, through a center, and out through another nerve. THE SEAT OF THE PAIN IS NOT ALWAYS THE SEAT OF THE LESION. If such a patient comes to you, do not become a masseur; do not treat the seat of his pain, but treat the seat of the lesion causing the trouble, and convert him by showing him true Osteopathy.

A PECULIAR PHENOMENON is often witnessed. You may meet a case in which one part of the body is more sensitive than another; you may have paralysis, both muscular and sensory, below an injured part, with acute hyper-aesthesia above. The explanation which has been given in such a case is two-fold. In the first place, take such a case as a fracture of the spine; the parts about the site of the injury are the seat of the inflammation; after the fracture the parts are engorged with blood; there are exudations, both fluid and cellular, about the parts, which may press upon the origins of the nerves just above the seat of the fracture, and may irritate for a considerable distance up the spine, thus causing considerable sensation above. Below, the nerves have been injured by the trauma to the cord causing paralysis. The other explanation is the same except that in it the origin of the spinal nerves is taken into consideration; as you go further down the

spinal column you will find that the roots run more and more obliquely in the canal, until finally the lower ones run an inch and a half or an inch and three-quarters before emerging. When the impingement is upon the origin of those nerves, the pain will be at their distribution upon the muscle and surface of the body. I had a case similar to this, a man who is still in town for treatment. He has paralysis of the lower limbs, almost a complete lack of muscular ability and of sensibility in the lower limbs. The lesion is in the lower part of the spine. He has a terrible itching and smarting along the spine; upon treatment, however, he readily recovers from these symptoms. Now, the explanation may be similar to that given, and it may partake of the reasoning that I gave you the other day concerning Osteopathic matters. That is, that there is too much life above, and there is too little life below; something has interfered to cut off nerve and blood flow below, while that above is supplied with its full quota already and does not need that which is misdirected to it, thus there is irritation to the parts above and the resulting symptoms. What the Osteopath does is, as was indicated, to try to restore the equilibrium of nerve and blood forces to the lower parts of the body which are suffering, and then to the parts which are impinged upon above. To do this he goes back to the parts affected.

Q. In the event of peripheral trouble, sensation, would you also find the sensation at the origin?

A. Not necessarily. You might not have any sensation there, Otherwise, the patient would have himself perhaps discovered it. You may not have a sore spot at all; it may be such a lesion as spreading of the spines or approximation of the spines, not necessarily any tenderness at the central point, at the lesion.

Q. Are there no exceptions to the rule that where there is pain on the surface, not accompanied with rise of temperature, the trouble is of spinal origin?

A. I took Hilton as authority there, and he gives this example. It is just as invariable as in the case of inflammation, in which the principal sign is rise of temperature. You may have the swelling and the pain without inflammation, but if you have these two, and heat also, it is a sign of inflammation. He makes a parallel and says it is just as invariable that if there is pain upon the surface of the body, not accompanied by rise in temperature, the cause is of spinal origin; he does not make any exception.

Q. I understood you to say that the 5th nerve was reached through the sympathetic?

A. The 5th cranial is reached through the superior cervical ganglion. We get results which justify us in saying this; any operator will

tell you that he gets results from the superior cervical that influence the 5th nerve. Of course he does it by sympathetic connection, which I will explain at another time.

Q. In the case of that man with the pain on the inside of the knee, suppose that he should have had localized trouble at the knee, would you have recognized the condition by the lesion in the spine?

A. Yes, partly, and you would have to go into the history of the case. You would have to go back to your centers and determine what was the trouble.

The first thing would be to go to the spine and thoroughly examine; if you find a lesion there, the probabilities are it is of spinal origin. You should by all means, whenever you have such a case, or any case, go back to the center of the nerve supply, and you may find a lesion there, above or below the center, or you may not have a distinguishable lesion.

Q. In the event of a severe gastritis would there be a soreness in the spinal region?

A. Very likely there would be, and in that case your soreness and congestion of the muscles would be what I have explained as secondary.

Q. Which would be secondary?

A. The congestion of the muscles along the spine. In a case of severe gastritis you would very likely find sore spots along the spine. The explanation being that the nerve influence from the disturbed stomach travels along the sympathetic branches of the solar plexus back to the spinal connection of those nerves, and then passes through to the peripheral termination of the spinal nerves in the muscles of the back.

Q. Is it true that you can designate which organ of the body is in trouble by finding the tenderness in certain spots in the spine?

A. Yes, in general that is true. I thought I brought that point out in my last lecture. The sore spots may be due to either peripheral or central trouble, and by determining whether they are primary or secondary you may locate the trouble by reasoning from the center to the periphery.

LECTURE VI.

At the last lecture I called your attention to the further significance of the clicking in the neck, stating that it frequently meant a lack of lubrication secreted in the synovial membranes. I began to take up the general effects of lesions of plexuses along the spine, taking up the first group, the upper four cervical nerves. I called your attention to the fact that pain must be referred to the origin of the nerve supplying a part, instancing the anterior pendulous portion of the ear and the posterior

portion of the ear as being supplied by the second cervical nerve, versus pain in the other parts of the ear indicating lesion in the fifth cranial nerve. Hilton considers diseases of the upper cervical portion of the spine among those most dangerous to life. The operator must not confuse symptoms with causes. He must not take, for instance, some symptom which may be prominent, thinking it to be one of the first causes. If there is pain upon the surface of the body not accompanied by rise in temperature, it indicates disease of spinal origin. A peculiar phenomenon often witnessed is that there is paralysis of sensation, or motion, or both, at a point below a spinal injury, while there is acute hyperesthesia just above. The explanation was given that it was owing in part to the obliquity of the course of the spinal nerves, in part to the engorgement of the parts and the exudations, fluid and cellular, which take place around a serious lesion of the spinal cord. To-day I wish to pursue this line of thought somewhat further, hoping to finish in this lecture. That is, this general point of the significance of general symptoms to the Osteopath.

I. FURTHER CONSIDERATION OF OSTEOPATHIC SIGNIFICANCE OF POINTS FOUND IN DIAGNOSIS.

The lower four cervical nerves and brachial plexus constitute what is known as the **SECOND GROUP OF NERVES**. The brachial plexus sends short branches to the shoulder and upper intercostal muscles, and long branches to the arms. In general the effects which may follow lesions to the second group of nerves are paralysis, spasms and neuralgias. Such troubles the operator must learn to refer to the center; that is, to the origin of the plexus along the spine. Should you have palsy of the hand, or œdema which is neurotic in origin, such cases you must refer to trouble in the brachial plexus. Of course this is speaking of these nerves as members of the cerebro-spinal system. Please remember, also, that the **FIRST GROUP OF NERVES IS CONNECTED WITH THE UPPER CERVICAL GANGLION OF THE SYMPATHETIC**, and that the **SECOND GROUP OF NERVES IS CONNECTED WITH THE SECOND AND THIRD GANGLIA OF THE SYMPATHETIC**, and that in case the lesion be severe enough to affect sympathetic life, you may, in lesions in this region, have far-reaching disturbances. Remember also that from the third, fourth and fifth cervical nerves arises the phrenic nerve, and that injury here may cause diaphragmatic trouble; hiccoughs for instance, which we treat in that region.

The **THIRD GROUP OF NERVES** is composed of the twelve dorsal nerves. Of these the *first six are connected with the first six dorsal ganglia of the sympathetic, and the last six but one are connected with the fifth to the twelfth dorsal ganglia of the sympathetic.* In their capacity as spinal

nerves, the members of this third group are subject, usually, to merely sensory affections. You will frequently meet in your practice, cases of intercostal neuralgia. This the Osteopath diagnoses, and he is usually correct, as a pressure upon the nerves, caused by crowding together of the ribs. Later, when we come to the consideration of the thorax, you will find that we make prominent the point that the ribs are dropped together frequently, or are drawn together, and you will learn to reason thus, as in the case of intercostal neuralgia, from the Osteopathic point of view. Lesions here may also cause herpes zoster, commonly called shingles, a nervous affection, accompanied by eruptions upon the skin. From their sympathetic connections this group of nerves may be associated with troubles of the pleura or lungs, and with sympathetic troubles of the viscera, as the splanchnic nerves run from the sympathetic connections of the dorsal nerves to the various viscera of the abdomen.

The FOURTH GROUP OF NERVES is composed of the five lumbar nerves, *the upper four of these nerves, with the twelfth dorsal, are connected with the upper four lumbar ganglia of the sympathetic.* Diseases which may affect these nerves as members of the cerebro-spinal system are mainly neuralgic. Of course you may have paralysis or spasms, but you are not so liable to have them as in lesions of the nerves of the cervical or sacral region. Sympathetic troubles would occur according to the centers with which these nerves are connected.

The FIFTH GROUP, finally, is that composed of the five sacral nerves. *These five sacral nerves, with the fifth lumbar, are connected with the five sacral ganglia of the sympathetic.* Lesions affecting these spinal nerves are such as affect the cervical nerves, paralysis, spasms, and neuralgias, which may vary greatly in character. You may have tonic or clonic spasms of the lower limbs; you may have neuralgia, such as sciatica; or you may have paralysis of the lower limbs. Sympathetically you would refer to such troubles as are indicated in the outline of centers given.

I have thus taken up the grouping of the nerves along the spine. Of course it has been very general. The purpose has been to give you a general view of regions affected, and to give you a general idea of how the Osteopath looks at disease; that is, he reasons from periphery back to center. My treatment of the subject has necessarily been general, leaving aside a more particular view until such time as we shall take up these different affections which we meet, more in detail. I may in these last few lectures have been a trifle obscure; I find it a rather difficult subject to elaborate and, being so general, it may have been indefinite. Still I trust that it may have fulfilled its object, which was briefly as follows: In the *first* place, to indicate to you the necessity of keeping separate in your mind the cerebro-spinal system and the sympathetic system. Remember that you cannot separate these entirely, but look

for symptoms from the one and from the other. You do not really find them so separated in your practice. *Second*, to impress you with the importance of diagnosis based according to centers affected. *Third*, to teach you not to confound incidentals with essentials; not to confuse mere symptoms with causes of disease. I thought I could thus indicate to you that Osteopathic point of view, that Osteopathic habit of mind in looking at disease.

Hilton states that as a rule PAIN IN DISEASE OF THE LOWER CERVICAL, DORSAL AND LUMBAR REGIONS IS INDICATED BY PAINS SYMMETRICALLY UPON THE SURFACE OF THE BODY; that in the upper cervical region being not indicated symmetrically by pain upon the surface of the body. The original cause for such pains we would look for in a central lesion. If the trouble be bi-lateral, located on each side of the body, we would look for a central cause, or perhaps the cause may be bi-lateral. I instanced a case at the last lecture of pain over the skin at the pit of the stomach, being referred to the course of the nerves to the sixth and seventh dorsal vertebræ. Hilton instances a case in which a boy had severe pain there; he went about stooping, holding his hands over that region. Upon lying down the pain disappeared to some extent. His diagnosis of that case was that there was trouble at the sixth and seventh vertebræ, and he found disease there of such nature that it exerted pressure upon the sixth and seventh nerves upon both sides. Another case similar was more complicated in that it led to vomiting. Almost any physician would have diagnosed such a case as stomach trouble, no doubt. Hilton, however, upon examining the tongue found no indications of stomach trouble, and diagnosed that case also as disease of the sixth and seventh vertebræ, directed treatment to those points, and was successful in curing the case. Sometimes in such diseases we find a pinching feeling about the body, a feeling as if the body were girdled. Now, as to the reasons why the pains are symmetrical in these parts of the body, I have already indicated. But why they do not occur so above is this: the difference in the nature of the vertebræ. Thus, below the second cervical, the vertebræ articulate with each other by their bodies and articular processes, but above that point it is different; the atlas articulating with the occiput by just two points, and one might be affected without communicating with the other. The articulation of the atlas with the axis is by just three points; the odontoid process articulates with the anterior arch of the atlas, and the bodies by the articular surfaces. Now, any one of them may be affected, and it is the rule that one of these is affected without communicating the disease to the other. Thus you may have a symmetrical distribution of the pain below the second cervical, but not above.

*A further point of importance is that *if a certain organ is affected, the impulse may be transmitted sympathetically from it and be reflected to another organ, and that always in such a case it is carried to that organ connected most closely by nerve strands to the organ first affected.* Bryon Robinson says that ganglia of the sympathetic, especially the cervical ganglia and the abdominal brain, are POINTS OF REORGANIZATION OF IMPULSES sent to them, and of REDISTRIBUTION OF THESE REORGANIZED IMPULSES, which are sent to various viscera, in general, to those most closely connected, those which are furnished with the greatest number of nerve filaments. I quote him as follows: "It is a principal in physiology that when a peripheral irritation is sent to the abdominal brain, the reorganized forces will be emitted along the lines of least resistance, so that the organ which is supplied with the greatest number of nerve strands will suffer the most." He cites here a prominent instance of uterine tumor affecting the heart, and in this way, that the influence of the uterine tumor upon the hypogastric plexus was reflected to the solar plexus, where it was reorganized and sent out along the splanchnics to the superior cervical ganglion and the next two below it, and was then sent out along the three cardiac branches to the heart, thus causing an irregularity of the heart, leading finally to heart disease. This point is of great importance to the Osteopath. You will find it very common in your practice to find a case of uterine trouble resulting in headache. Thoroughly apply any of the ordinary methods of treatment to the headache, and they will be unsuccessful. You must learn to diagnose with these things in mind, and to reason according to the connection of these parts through the sympathetic system. Now, in the instance given, the impulse might have been sent differently. It might have passed from the hypogastric plexus to the solar plexus, being there reorganized and then sent out to other viscera throughout the body, as is frequently the case. Or it might have run up through the sympathetic cord, reaching the medulla, then affecting the vagi nerves, resulting in stomach trouble. Another illustration I take from him. He calls to mind the fact that the kidneys, ovaries, uterus and fallopian tubes of the female are developed from the Wolffian bodies in the embryo. They are thus closely connected in nerve and blood supply, and it is a fact that uterine trouble results often in kidney trouble, and kidney trouble may very readily result in uterine trouble. In such a case it is difficult to diagnose the case according to the symptoms, and to determine what must be the original cause. These secondary symptoms are frequently quite prominent, and treatment directed to them will not necessarily have any effect upon the original trouble.

*See appendix 2.

II. LANDMARKS CONCERNING THE SCAPULA. Holden instances the following points concerning the scapula. First, that it covers the ribs from the second to the seventh inclusive on either side; that its superior angle is beneath the trapezius muscle; that its inferior angle is beneath the latissimus dorsi muscle; this latissimus dorsi binds the posterior edge of the scapula closely down against the posterior chest-wall in a strong person. In case of consumptives the scapula is allowed to project outward at its lower angles, and this gives the peculiar appearance which is called, "scapulæ alatæ." A horizontal line from the sixth dorsal spine to the inferior angle of the scapula outlines the superior margin of the latissimus dorsi muscle. A line drawn from the root of the spine of the scapula to the twelfth dorsal spine outlines the inferior border of the trapezius muscle. In examining a back it is convenient to have the patient sit leaning forward with the hands hanging between the thighs; this brings the spine of the scapula down about the third intercostal space, on a level with the fissure between the upper and lower lobes of the lung.

III. HOW TO TREAT A SPINE:—Having learned how to examine a spine, having learned also the significance of points one finds along the spine in his examination, the next question naturally is, how to treat these points when observed. Often these noises which we may find in treating along the spine are of peculiar significance in this way: That often ribs pushed back into place cause such a noise. In our treatment of a spine there are two points which we may take into consideration; two objects which we may have in view. In the first place, we may wish to TREAT THE SPINE ITSELF. In the second place, we may wish to REACH, BY TREATING THE CENTERS ALONG THE SPINE, THE VISCERA TO WHICH THESE NERVES RUN. It is not always possible to disassociate these in your practice. I have divided these points thus simply for convenience in the consideration of them. You will, in practice, not be able to separate the results upon the spine itself from the result which you will get upon the centers when working along the spine, but the Osteopathy of it is the same, and I trust will be made clear to you by this division.

Now, when you are treating a patient, one very good way to treat the spine, to get everything relaxed, is to lay the patient on his face. The patient usually thinks he is relaxed when he may not be. I think those of you who are familiar with Delsarte methods will agree with me. Your first care is to see that the patient has become fully relaxed. Now, we wish to learn how it is that we may affect the central distribution of the sympathetic nerve. I spoke to you the other day of the gray rami communicantes extending from the ganglia of the sympathetic back to the spinal column, supplying the blood vessels of the dura mater and of the vertebræ, and the ligaments. Thus, if you wish to treat the spine itself,

wish to strengthen it, you must necessarily direct your treatment to reaching these vaso-motor nerves in order to relax and allow sufficient nutriment to be sent to these parts. In order to do this you must always first relax all the contractions of the muscles along the spine. Very frequently you will find that the muscles are contracted unevenly and slip under your fingers. That is a test; a muscle may be hard, as it naturally is, from exercise; then the hardness is homogenous. The first point, then, is to loosen the muscles, and in doing this it is well to bear in mind that you must work against the course of the muscle fibres, the deeper ones especially. It is perhaps easier in that way to get a relaxed effect, and your idea should be to work in such a way as not to hurt the patient. You may treat so hard and so roughly as to do damage. The thing you should guard against is too rough treatment as you may injure delicate parts. In seeking to relax a nerve you may irritate it, and thus cause the muscle to shrink. You should not manipulate with the tips of the fingers, you should turn the fingers so that the cushion of the finger does the work, and in that way thoroughly relax all the congested or contracted muscles along the spine.

What if you do not have any contracted muscles there? That, of course, is the condition in many cases. It is our work in such a case, where the muscles are flabby and there is a lack of tone, to stimulate all along the spine and thus to tone the parts. Do not be afraid of being thorough in this matter. You must relax all the muscles from the occiput to the coccyx, as they may any of them produce sympathetic troubles which may be reflected over a considerable portion of the body.

There is a certain amount of hair splitting done over the terms of desensitization and stimulation. Their significance I will take up later, but always bear in mind that your first point must be to relax contracted muscles if you find them; if you do not find them your work should be directed toward reaching the deeper structures mechanically and securing an equal distribution of nerve force. If there are contractions, no matter what your final treatment is to be, you must get rid of those contractions first. While the patient is upon his face there is an important effect which we get upon the spine itself. **THE WORK ALONG THE SPINE HAS ITS EFFECT UPON THE BODY ACCORDING TO THE CENTERS REACHED.** Suppose I wish to reach the center going to supply the nutrition for these parts, I spring the spine, using the arm as a lever, and by so doing you can exert a great deal of force. Drawing up the arms raises the ribs, and at the same time, by springing the spine I can get a considerable force all along. This is one way. Another way is to draw the limbs up; you will find this a very convenient method, this of course will bow the back and make prominent the spines, then you can readily reach under, and in that way you can spring the spine or any part of it; and it is always advisable for you to

stretch the spine in that way rather than to attempt to stretch the patient by pulling the neck. That is a tensile strain upon the spinal column, and it resists more than it does a lateral force. You will find this useful in your practice. There is another method which we frequently use; placing one elbow down against the upper edge of the pelvis, and the other against the prominent part of the shoulder, and separating them, also reaching over the spines of the vertebrae, you relax all along the spine. When you have done this upon one side, repeat it on the other. And why? Because when you spring the spine in this way all along you have stretched the ligaments upon that side, but you have not stretched the others. You can readily see that as I spring these spines the effect must be to stretch the ligaments on the convex side, and to relax the ligaments on the concave side of the curve. So you must turn the patient over, treat the other side, providing you wish to treat the ligaments upon both sides of the spine. You may treat the muscles alone in this way. When you have that object in view, usually you must exert considerable force, but do not dig. Do not use the ends of your fingers. You can develop strength so that you can keep the fingers flat and work with the cushion of the fingers against the muscle, and in this way you can get a good effect upon the muscles themselves. Do not be afraid, but keep at it until they are relaxed; do not treat too hard or you may stimulate, and they will contract more, but by deep work along the spine you may have a soothing effect upon those nerves and thus cause them to relax. What has been the object of this work? Simply this, that by relaxation of the contracted muscles, or by stimulation of those weak, flabby muscles, you have succeeded in drawing new life to that spinal column, and in that way you have made your first step toward reinstating the strength of that debilitated spinal column.

Q. Is a simple manipulation there enough to relax the contracted muscle?

A. Yes; simple manipulation is enough if rightly applied.

Q. Is a dislocation of a vertebra liable to cause giddiness?

A. It may very readily. It may act in such a way as to shut off the blood supply to the brain.

Q. More likely the cervical vertebrae?

A. Yes; more likely in the cervical region. Or it might act in such a way as to cause retention of the blood in the head and result in dizziness.

Q. If you had a patient who was unable to raise his hands above the level of the shoulder, and there was pain at the insertion of the deltoid muscle and also over the shoulders, where would you look for the trouble?

A. I would look for the trouble in the brachial plexus, the origin of the circumflex nerve, supplying the deltoid muscle. Also look to the scapular muscles and their innervation.

LECTURE VII.

At the last lecture I took up further consideration of the Osteopathic significance of points found in diagnosis. I called your attention to the troubles which may, in general, affect the lower cervical group of nerves, those which affect the brachial plexus, for instance, being chiefly spasms, neuralgias and paralysis. Also, I called your attention to the connection between those nerves and the sympathetic ganglia; also the connection of the third group, the dorsal nerves, except the twelfth, with the sympathetic dorsal ganglia; the diseases of this group being chiefly sensory. I then spoke of the connection of the fourth group, the upper four lumbar nerves and the last dorsal, being connected with the five lumbar ganglia of the sympathetic; the diseases of the fourth group being chiefly neuralgias, and not spasms or paralysis, although you might find them in that group. Spasms and paralysis, as well as neuralgia, being more commonly found in the fifth group; the five sacral nerves and the last lumbar being connected with the sacral sympathetic ganglia. I also traced in general the connection between these plexuses and diseases which might originate there, stating that my object in the last two lectures had been to aid you to keep separate the cerebro-spinal and sympathetic systems, to diagnose diseases according to centers, and to teach you to separate non-essentials from essentials. I instanced this rule of nerve force, that it is emitted along the path of least resistance, and that, sympathetically, the organ most closely connected by nerve-strands with the organ affected is most apt to suffer; that, in the sending of such impulses along the paths of the sympathetic system, certain centers such as the abdominal brain, are centers for reorganization of those impulses, so that, being reflected to these centers, they are sent out reorganized. I then drew some illustrations to account for phenomena witnessed according to this law. I then called your attention to landmarks concerning the scapula, and to treatment of the spine. That being the question you naturally ask after having learned to examine the spine. The general points brought out being that there is a treatment upon the spine itself, and a treatment of the spine for further reaching effects, chiefly through the sympathetics, upon the internal viscera. And I showed you, by laying the patient upon his face and upon his side, what was the technique of manipulation that we employ. I shall, in the latter part of this lecture, continue that subject. I have thought that for the first part of my lecture to-day it would be helpful to us to consider the Osteopathic theory of work upon centers.

I. HOW DOES THE OSTEOPATH BY EXTERNAL MANIPULATION UPON THE SURFACE OF THE BODY AFFECT INTERNAL NERVE LIFE? How can he reach centers in the spine, or nerve centers in any part of the body? What does the Osteopath mean

when he says that he stimulates or inhibits nerve action? Those are great questions. It is needless for me to say that they lie at the basis of our science. It is not a question as to fact. The facts are already proven beyond a doubt, but it is a question of finding a rational scientific explanation of facts, of establishing theories which lie back of our work. Osteopaths have different views concerning these matters. They answer these questions differently. I called upon the different operators in the building to give me a synopsis of what their views were. There were some who said they were not able to explain satisfactorily some of these things, and there was also some disagreement in their answers. I simply wish to add my little mite, not at all supposing that it will solve the questions for all time. There are, however, certain facts in relation to these questions which I think will be profitable to call to your attention, and I will also make some reference to the answers which I have received from the old operators whose experience has been wider than mine. Remember, it is not a question of, "Do you do this? Do you accomplish such results?" but, granted that the results are accomplished, which is true, how do you accomplish them? In approaching this question we must clear away all misapprehension as to definitions. Do we, when we say "inhibition," etc., mean the same as the physiologists mean when they say inhibition, stimulation, etc., and can we, in the generally accepted view, have such an effect upon the nerve as to inhibit or stimulate them? For this reason I will first define these points according to the physiological view, and then according to the Osteopathic view. The physiologist uses these terms in two senses. First, in the usual normal sense; a normal impulse sent from a center along a nerve or from a periphery along the nerve, resulting in function. For instance, an impulse is sent from the brain along a nerve causing the contraction of a muscle. Again, a sensation of pain comes from the periphery to the center, which thus receives it, and there is a sense of pain. In this case there was a stimulation of a sensory nerve by the agency producing the pain, no matter what that agency was. For instance again, the normal and continuous inhibition of cardiac action through the vagi by the impulse sent from the brain. Now, that is the normal and usual sense in which these terms are used. The second sense in which these terms are used by physiologists is, irritation of a nerve, and thus the stimulation or inhibition or function by physical agencies, as heat, cold, electric current, application of pressure or tapping, or the application of chemicals. That is what they mean when they say they have acted upon a nerve; have experimentally treated a nerve. They may, for instance, apply a caustic and elicit a sensation of pain, and state that they have stimulated the nerve. They may for instance again, apply an electric current, stimulate the nerve and cause muscular contractions. Or, finally, they may, by pressure or tapping upon the nerve, carried to the point of

exhaustion, secure the result of paralysis, that is, inhibition of the nerve action, resulting in the loss of sensation or of motion, or of both. They then say that they have "inhibited," desensitized the nerve. They thus by the use of physical agencies produce such results, similar to the normal, for instance, the contraction of muscle, and reason that the impressions aroused by such agencies are similar to normal; they have really stimulated, or inhibited. For instance, they by some agency, the use of an electric current, so stimulate the periphery of the sciatic nerve that they get a vaso-motor effect in the nerve. They reason that, as they have stimulated the nerve fibres in a manner similar to normal, therefore there are sympathetic vaso-motor fibres in the sciatic nerve. This was the actual method employed in determining that vaso-motor fibers were contained in the sciatic nerve, and this was accepted by the authorities. I believe that I have thus correctly represented the views of the physiologists in the definition of these terms.

Second—HOW DOES THE OSTEOPATH DEFINE THESE TERMS? What does he mean when he uses them? He uses them, of course, in the normal, physiological sense, which we will leave aside. He also uses them in another sense, which for the present we will leave aside also. But the question to-day is, does he by a physical agency, that is, by manipulation, by pressure, by tapping, and stretching, all of which he uses in effecting nerve filaments or nerve centers, produce a result similar to normal, and may he be, with the physiologist, allowed to reason that therefore the impulse which he has aroused by the use of such physical agencies is similar to the normal? A pressure on the phrenic nerve controls the spasm of hiccoughs. The result of the use of such physical agency is similar to normal, hence the impulse must have been similar to normal. Again, by rubbing the neck in the region of the superior cervical ganglion, he stops bleeding from the nose, and produces an effect similar to normal, hence the vaso-motor influence generated by irritation in that region must be similar to normal. He says he inhibited the phrenic or stimulated the superior cervical ganglion. We must allow him equally with the physiologist to say that he has stimulated, or inhibited the nerve in question. Now, the question at once arises, what was the manner of the application of those physical agencies? Does the physiologist, as well as the Osteopath apply these agencies externally? Of course if there is a difference in application, then our reasoning would not hold good. But my reply here is, yes, he applies them externally, though not always. Still, if he, the physiologist, does it only sometimes, and obtains results which justify him in saying that he has really stimulated or inhibited, the case is proven for the Osteopath, even though the latter works externally always, providing only that the Osteopath obtains as wide range of results as does the

physiologist, who works both externally and upon the exposed nerve or center. That the Osteopath, by his means, obtains results in every part of the body is shown by cases upon record.

I wish to quote from standard texts to show that the physiologist does work externally upon the body to produce his results. In the first place, I quote from Dr. Lombard, Professor of Physiology in the University of Michigan, in Howell's American Text Book: "If pressure be brought to bear on the ulnar nerve where it comes across the elbow, the region supplied by the nerve becomes numb." Now, in the context he explains that everyone has occasion to demonstrate this upon himself, evidently implying that external pressure was used. W. T. Porter, M. D., Assistant Professor of Physiology in Harvard Medical School, in the same text book states as follows: "The reflex action of the sympathetic nerve upon the heart is well shown by the experiment of F. Goltz. On a medium sized frog the pericardium was exposed by carefully cutting a small window in the chest wall. The pulsations of the heart could be seen through the thin pericardial membrane. Goltz now began to tap upon the abdomen at the rate of about 140 times a minute with the handle of a scalpel. The heart gradually slowed and at length stood still in diastole. Goltz now ceased the rain of little blows. The heart remained quiet for a time, and then began to beat again, at first slowly and then more rapidly. Some time after the experiment, the heart beat about five strokes in the minute faster than before the experiment was begun. The effect cannot be obtained after section of the vagi."

I have thus quoted at length to show with exactness the manner of experimentation and the external application of this physical agency which was employed. Again, the physician in applying the electric current to a living patient for the purpose of diagnosis or treatment, applies the same externally. I quote from Dana; "Statical electricity is applied from fifteen to twenty minutes daily or tri-weekly. For general tonic or sedative effects, sparks are drawn from all parts of the body except the face; in paralysis or spasms of pain, sparks are applied to the affected area. In general electrization, whether galvanic or faradic, the indifferent electrode is placed on the sternum, feet or back, and the other pole is carried over the limbs, trunk, neck, and if indicated, the head." In course of the argument I wish to instance what I heard Dr. Eckley say once concerning the surgical method of treating sciatica. He said that an incision was made through the gluteal muscles down to the nerve, laying it open to view; that a hook was then used, and the nerve stretched with a force about forty pounds, that is, sufficient to raise the toe of the patient from the table, the patient lying on his face. That was the surgical method of stretching the nerve to relieve cases of sciatica. He also went on to say that the method used nowadays is that of flex-

ing the thigh upon the thorax, thus giving a strong tension to the nerve. That is the treatment used to-day by physicians for the cure of sciatica. You will see that that was external manipulation, that the application of electrical current was external, the tapping upon the abdomen was external, and the pressure upon the ulnar nerve was external. I have simply endeavored to show that the Osteopath, in treating nerves and centers, employs physical agencies externally. In one case the physiologist is allowed to say, and it is accepted by the authorities, that he has stimulated a nerve, stimulated nerve action by this means, and inhibited nerve action by this means, and my argument is, therefore, that in the same manner the Osteopath must be allowed to say that he has stimulated or inhibited nerve force, and that we therefore use these terms in the generally accepted manner. This is my view of the subject, and I believe my conclusions are reasonable and fair, that from the results accomplished, means employed, and manner of application of the physical agency by the physiologist and by the Osteopath, the latter is as much entitled as is the former to the use of the terms stimulation and inhibition in their generally accepted sense.

I shall follow this subject further for a lecture or two. There are many points in relation to the work upon nerve centers which are obscure, and which I think I can with value attempt to illustrate before you.

II. HOW TO TREAT A SPINE. (*Continued.*)—Whereas, the last time I gave you the treatment for the spine itself, to-day I will take up the consideration of treatment of the spine for distant effects. The point here is, that we may not only treat the spine, with the patient upon his face, for immediate effects to the spine, but we may treat to reach viscera through the sympathetic nervous system. Your first object is to relax all the structures, as in the other case, for the reason that tension here in the muscles may affect a center, it may affect not only the center which relates to the spine itself, but a center, for instance, the splanchnics, controlling the stomach, or the kidneys, or the bladder, or some of the internal viscera. You will very commonly find sore spots along the spine. The indication is usually that they are the seat of lesions. We reason, then, according to the sore spots, or according to the contraction of the muscles, or according to the separation of the vertebræ, or whatever the lesion may be, to the centers of the sympathetic affected. If we know where the different centers are situated along the spine, and find a lesion at a certain point, we can reason what the result would be, or vice versa, by finding a certain disease manifest in the body we can trace back from the disease to the center, and expect to find a lesion at or near that center. For instance, suppose I had examined this gentleman and found that he had lung trouble, I would then, according to Osteo-

pathic procedure, go back to the centers along the spine, and I would look from the second to the seventh dorsal for a lesion, and if I did not find a lesion, I would still stimulate in that region. I might here instance a case that I have treated, a case of congestion of the lungs associated with heart trouble, where there was great difficulty of breathing, considerable pain accompanied by pallor and general debility, and there was every indication that the lungs were affected. And by applying not more than a minute's work in this region, from the second to the seventh dorsal on both sides, the patient sitting upon a stool, I, standing behind, raising the ribs and stimulating the centers, got a good effect. Sometimes in such a case you have to work quickly, and in some cases you will find that it will not do to have the patient lie down.

If I should, for instance, be treating this gentleman for stomach trouble, having in my examination and in my conversation with him found that he was so afflicted, I would look for some lesion along the spine in the region of the splanchnics, from the sixth dorsal down to the twelfth (especially the upper splanchnics for the stomach). And in that event, how would I go about to treat him? Simply by use of the points which I gave you in how to treat the spine. I would loosen the spine, and relieve any tension in the ligaments which I find, I would stimulate the muscles all along in this region, and work out any sore spots, and any contracted muscles. This contracture, or tightening of the muscles, I shall go into deeper in the course of a lecture or two. Thoroughly work along the spine, not too hard, using the flats of the fingers, which requires some strength in the muscles of the forearm. You need not be afraid of the patient, you need not be afraid to apply your treatment thoroughly, but you should use your judgment as to how long a treatment you should give. It is very hard to say anything as to the length of time of treatment; you will have to learn that for yourselves. Though in general a young Osteopath will treat a very long time, and an old operator will treat a much shorter time.

If I should find that there was genital trouble or trouble with the pelvic viscera I should naturally look along the centers in the lumbosacral region, and I would very likely find a lesion at the fifth lumbar, where I would find a soreness. In that case I would relax all the parts; I would bring the legs up against me and get a close application of the hand to the affected spot. Then holding in the sacro-iliac articulation, and, by lifting up against it allowing the weight to hang down from that point, I spring the pelvis and bring pressure upon these ligaments, first on one side and then on the other, relaxing all the structures around the fifth lumbar, preparatory to reducing any slip which may be found there. Suppose there was not a slip there but simply a sore spot, my object would be then to **work out** the sore spot and thoroughly relax

the tension. I will take up the setting of the slip of the innominate at another time.

In the examination of a spine we may find a vertebra lateral at any point. Suppose, for instance, that the twelfth dorsal is slipped laterally, toward the right, we would very probably find that the sore spot was on the right side, as the sore spots in the muscles are, as a rule, on the side to which the spine is slipped, though it may be on the other side. I would first treat here at the twelfth dorsal, loosening the muscles about that point. How do I know when I have done enough of that? In general, when you find a more relaxed condition there. You cannot always at the first treatment relax all the muscles; you will find cases very stubborn. I have treated cases where the muscles would relax under treatment but would contract again immediately. It will depend upon the case, but work a reasonable length of time and relax all parts if possible. After I have relaxed all the muscles upon the right side about the twelfth dorsal, I pursue the same course on the left side; then go deeper than the muscles and stretch the ligaments. What is the condition of those ligaments when the spine is slipped in this way? I have shown you in a previous lecture that they are probably all upon a tension, some forward and some backward. What we seek to do is to spring the spine. By springing it toward you, the patient lying on his side, you get the curve above and thus stretch the ligaments on this side, then turn the patient over and go through the same process upon the other side. Now, you will naturally want to know how soon to attempt to reduce this slip of the vertebra. Most young Osteopaths when they find a dislocation want to put it back into place at once. You can do that only in rare cases. In a recent dislocation, if it is not very serious and does not set up a great amount of inflammation, it may be reduced at once. In an old dislocation you will have to work a considerable time to relax all these parts, throw new blood and nerve force there to endow them with new vitality which they have been lacking, and you will have to learn by practice to work a sufficient length of time before attempting to set a vertebra. There are several methods of doing this. One of the best is to first EXAGGERATE THE CONDITION. I would, in this case, have my patient upon a stool, the spine being tipped over toward the right, I bend the patient so as to exaggerate the condition, and thus bring tension upon the ligaments upon that side. I have before brought tension upon the other side and relaxed everything as far as possible, and by working the patient up and around holding against the spine of the vertebra, I in that way slip it back into place. It does not always go back. You will perhaps have to pursue that method of treatment for a considerable length of time. But remember, that in setting a misplaced vertebra, in general the method is to exaggerate the

condition, and that you then work in just the opposite way and throw the curve in the opposite direction.

Q. I do not understand the connection of the 5th nerve with the pneumogastric.

A. The pneumogastric supplying the stomach is affected directly from an exciting cause, the impulse passes along the pneumogastric going directly to the medulla, which is the center for all of these nerves which arise from the floor of the fourth ventricle, and then directly out over the 5th cranial nerve. It has been proved that an impulse can be sent from a nerve, through a center, and out over another nerve.

Q. In referring to the work we have gone over, I do not quite understand why a click in the neck in the cervical region should be more serious than in the rest of the spine.

A. Well, I so stated simply because it has been my experience that I could find these noises all along the spine when they mean nothing at all, the subject being perfectly healthy. While in the cervical region it seemed to me that there was always some contraction or slight break between the parts, likely enough to be serious. It showed that the blood supply had been cut off, thus diminishing the supply of lubricating material in the synovial membrane. I said that it was in general more serious, because my experience in practice seemed to bear out that point.

Q. In the case of a lateral displacement of the atlas, would you exaggerate the condition also?

A. Yes, sir, as far as possible; but to set an atlas is quite a technical matter. I will take that in detail later.

Q. Suppose there was a spinal curvature, would you set it in the same way you would a single vertebra?

A. In that case you would use the same general method, but you would begin at one definite point and try to set it, and then work upon the next vertebra, and so on.

LECTURE VIII.

At the last lecture I commenced to consider the Osteopathic theory of work upon nerve centers. That is what I have called the subject in general, although it includes not only nerve centers, but nerve distribution and blood supply; how the Osteopath works by external manipulation upon the surface of the body, gaining results internally. I first defined the terms stimulation and inhibition, and showed that while they are used in several senses, the Osteopath uses them in the usual

sense. Our conclusion was that the Osteopath was justly entitled to the use of these terms stimulate and inhibit nerve action, and that he works in the same manner as the physiologist when he is experimenting upon these nerves. That since the physiologist, gaining results which were similar to normal, reasons that he has therefore affected the nerves in a manner similar to normal, the Osteopath should be allowed to say that, since he has gained results similar to normal, he has also affected the nerves in a normal manner. Taking away the sensitiveness from a nerve, or the excitability, or its excited condition, is really an inhibition of nerve force. Or it may amount to this, that we affect the conductivity of the nerve, and that is what I meant by the use of the word desensitize. We then are privileged to say that by external manipulation we have really stimulated or inhibited a nerve. If we have worked upon nerves and upon nerve centers in that way, we have produced certain results. The point that the physiologist works externally only sometimes, while we work outside altogether, does not make any difference with the argument, from the fact that we have as broad a range of results to show for our work as he has by both external work and work upon the exposed nerve. I think that my position taken at that time was sound.

I. THEORY OF OSTEOPATHIC WORK UPON CENTERS.

(Continued.)—Our operators agree that we secure direct results upon nerves by mechanical work, and while they do not all fully agree in all they say, I gather from the communications they have handed me that they all take that view of this matter. For instance, Dr. McConnell says: "We affect internal nerve action by manipulation on the external parts of the body, by a general mechanical stimulation given to the nervous system." He says further, that we stimulate or inhibit sometimes, but that he believes there is a general misuse of these terms, and that the results which may be expressed in these terms are not often the result of some direct inhibiting or some direct stimulating work that we put upon an affected point. But we will bring that point up when I come to take up the further definition of these terms according to the Osteopathic point of view. Dr. Harry Still says: "We inhibit by pressure or by holding, thus cut off nerve action, and break the force between the brain and the termination of the nerve." He also says that work outside upon the body, that is manipulation, produces a direct effect upon the nerves through pressure, thus affecting sympathetic life through its connection with the spinal nerves or their centers. He instanced the pneumogastric. Mrs. S. S. Still's reply shows that her idea is that we either directly or reflexly affect nerves or centers by external manipulation. Dr. C. M. T. Hulett well illustrates in part the theory of our work as follows: "Pressure upon a nerve fibre will cause a break in

the continuity of the semi-fluid axis cylinder, and if abnormality exists, then the ever present tendency toward the normal will tend to restore normal conditions." I understand him to say that we may obtain that result by pressure upon a nerve, by external manipulation, which is the method we employ. Dr. Hildreth and Dr. Charles Still both have something to say about this. I could not get their communications to-day, but will bring them later. Thus, as you see, there is considerable unanimity upon this point. I have not quoted all these parties have to say, but I shall quote from them to explain further points when we come to them.

Remember that this is not the only effect that we get upon nerve-centers or nerve life, this mere stimulation or inhibition as we may be privileged to call it, but we get important results. I leave this subject to consider a different point—there are other means at the Osteopath's command by which he may affect blood and nerve force. These means are important, but they are not what we style the most important means at our command. They are, however, important as being external, non-medicinal methods of reaching deep blood and nerve force. They are not distinctly Osteopathic; they are simply adjuncts to our work. One of these is the external application of heat or cold. Green, in his Pathology, says: "It seems that vascular dilation of deep organs may be produced reflexly by the application of stupes to the skin." They are invaluable as adjuncts which the Osteopath may call to his aid if necessary. I may instance here that in case of inflammation following some injury, you may find the parts so swollen as to make it impossible for you to determine whether or not the parts are broken, or what the condition really is. You will frequently find that in such cases you must first reduce the swelling before you can apply your Osteopathic work. Not to say that we do not do it Osteopathically, for we do. In the case of a swollen ankle we may by manipulation of the venous flow, loosening the structures about the femoral vein, aid in taking down the swelling, but you will find that if such cases be of any great extent, you must bring in the application of heat or cold; you will have to use fomentations and the applications of dry heat very often, and it is always advisable to have a good supply of hot water near you in case you have a patient where it is likely to be necessary. For instance, if you are treating a patient for some disorder and he is continually troubled with cold feet while lying in bed, you must use the application of heat, the idea being to get the patient as comfortable as possible, and to get a good distribution of blood throughout the system; also to prevent collateral hyperemia on account of having too little blood in one part. I think this is a good therapeutic hint for the Osteopath. You must pay attention to these details, or some such little thing may hinder to a consid-

erable extent, the results you are trying to attain. The idea is to equalize the flow of blood throughout the body. The application of cold is frequently useful, though we do not use it very often. I spoke of fomentations; that is a term applied to a hot, moist application. You will frequently find it useful to wring out a cloth in hot water, as hot as can be borne, and apply it to parts, repeating the operation frequently. This is a fomentation, while dry heat is applied by means of a hot water bag, or some such thing. Bear in mind that these things are good in our practice.

You may also get a VASO-MOTOR EFFECT BY APPLICATION OF COLD. Speaking of renal constriction, Howell's Text Book says: "The same effect (renal constriction) is easily produced by stimulating the skin, for example, by application of cold." Remember that we as Osteopaths do not depend upon the use of these agents, but I call your attention to them as valuable, non-medicinal adjuncts to our practice, and also as supporting, by quotations from the standard text books, the contention of the Osteopath, that without medication the blood and nerve forces of life may be regulated to produce health. This is, too, valuable in our arguments with medical men. It all tends against the use of medication.

I believe that the Osteopathic position may be still further strengthened by considering the effects produced, on the one hand, by the use of chemicals, drugs, or electric currents, and on the other hand by the Osteopath in his use of mechanical agents. In the first place, *drugs and chemicals introduced into the system alter normal chemical conditions in which the nerve must be in order that its normal irritability may be preserved.* In Howell's Text Book it is stated that the introduction of digitalis, ether, alcohol, water, etc., changes the condition of the irritability of the nerves. "From all these results it becomes evident that the normal irritability of nerves and muscles require that a certain chemical constitution be maintained, and that even a slight variation from this suffices to alter, and if continued, to destroy the irritability." Now, it is the physician, and not the Osteopath, who introduces these abnormal chemical conditions, thus destroying the normal irritability. I grant the force of the physician's argument when he says that he supplies these drugs for the purpose of supplying to the body some elements which are lacking, but I doubt whether that is the general method of medication. Where digitalis is given to retard the action of the heart, it paralyzes the nerves, and in that case certainly it was not given to supply the lack of some such constituent in the system. On the other hand, the Osteopath does not introduce any of these foreign substances. He stimulates nature, and nature supplies from the food these various things which

are needed to keep the normal chemical conditions under which a nerve or muscle is normally irritated.

I further quote from Howell's Text Book to show the abnormal effects of electricity. "Undoubtedly, chemical and physical alterations may occur in nerves as the result of the passage of an electric current through them, and it would seem that the loss of conductivity which they show when subjected to strong currents is to be accounted for by such means." "The conductivity, like the irritability of nerve and muscle, is greatly influenced by anything which alters chemical constitution of active substance." Hence it must be that electricity, chemicals and drugs produce abnormal changes in nerve tissues. Therefore, I maintain that the Osteopath may secure better results from his manipulation than may the physician by medication; for, whereas the latter introduces into the system those agents which by their nature produce abnormal changes in nerve tissue, the Osteopath introduces no foreign matter. Moreover, he may, through his manipulation, attain results very similar to that produced by normal physical exercise of parts of the body. I might explain here the effect upon the nerves of an athlete in stooping and jumping. He may, for instance, stoop in such a way as that the thorax is bent upon the thighs, the knees touching the shoulders, and the sciatic nerve is stretched, just as we stretch it in sciatica. There are normal exercises, the results of which, if we can judge at all, are exactly similar to results we obtain by giving a certain motion which is in our stock of remedies, we might say. Thus we reason concerning various contractions of muscles, motions of the back, bringing pressure upon the parts and thus keeping them stimulated up to the normal. I think that the similarity is readily seen between normal exercise on the one hand, and the application of Osteopathic methods on the other; and the difference between the application of violent means such as the use of electric currents, chemicals and drugs, and the application of normal exercise to the parts by Osteopathic manipulation. In the treatment of disease, normal exercise differs from Osteopathic treatment, in that the Osteopath has the patient passive in his hands and can work at will. These are not exercises upon his part, and it may be that he, being ill, would not be able to undergo such exercises of his own free will.

Remember that the points which I have brought out have been adduced in favor of the argument that we may work externally upon the body, and thus stimulate or inhibit nerve force. But we do not consider that the most important part of our work. What we consider more important than that I shall take up when I come to describe what the Osteopath means in the second sense in which he defines these terms, and this is but one part of the argument. I shall at the next lecture attempt to carry this line of thought a little further by quoting from

authorities in support of the view that we may stimulate or inhibit nerve force by external work.

II. HOW TO TREAT THE SPINE.—(*Continued.*)—I showed you at the last lecture how to treat a spine where a vertebra was displaced laterally. To-day I want to show you how to proceed when you find the SPINES SEPARATED. If by examination we find that there is a separation between the twelfth dorsal and first lumbar, how should we go about to rectify the condition? In such a case our method of reasoning is that there is a lack of tone; there is a relaxation of the ligaments; we would rather expect that, though it is not necessarily so. And in that case, we would first go about to restore tone to all the parts before proceeding further. I need not go over the same ground of explaining to you that you thus here reach the central distribution of the sympathetics all about this part which is lacking in tone, but in this case that would be the first, and you might almost say the only, step. The probabilities are we would not be able to put these vertebræ back into place at once; you cannot do that often. Thoroughly stimulate and loosen the structures, and patiently await results, and you will gradually see those spines coming together. So that your best method is to stimulate, first on one side and then on the other, using the motions I have given you, bring about a strengthening of those parts. You need not work just between the twelfth dorsal and first lumbar; work a little higher and a little lower, and get a good effect all about the parts. Probably this motion of getting the elbows between the pelvis and shoulder, and spreading while you have the fingers on the opposite side of the spines, and springing as you spread, will obtain good results.

Q. If the three upper lumbar and two lower dorsal vertebræ are posterior, in that case would springing the spine in that way tend to bring it back to the proper position in time?

A. Yes, in part. I shall take that up when I consider variations from normal curves. That would be a part of the method, however.

Probably I would have the patient sit up on a stool in case they are separated. You can separate them a little more. Going upon the principle of exaggerating the defect, spread them a little more, thus allowing a stretch and a recoil, which naturally follows, and in that way throw new life to the part, and then we seek to push them together. You can lift up and push down, and approximate the parts in that way.

Q. In the lecture reference is made to paralysis without loss of sensation. Do we ever have loss of motion without sensation?

A. Yes, frequently. You will find that in your practice, loss of motion without loss of sensation.

Q. Do we have loss of sensation without, loss of motion?

A. Yes, sir, you may have either.

Q. Is epilepsy caused by displacement of the vertebræ?

A. Very frequently caused by displacement of one of the upper cervical vertebræ; we find it so in our practice.

Q. You were speaking of stimulating the circulation in the feet by the application of dry heat. Is there any practical Osteopathic treatment for cold feet?

A. Yes; but in case you have a severe case of cold feet it would be very difficult to at once throw enough blood to those feet to warm them in case the patient were very sick. You could not adopt measures strong enough on account of the general debility of the patient. But I will say this, that condition yields gradually, as do a great many other things, to treatment, and people I have known who had been troubled with cold feet for years would find, after a course of treatment of a month or more, that they were no longer troubled in that way; that the general circulation was better than it had been for years.

LECTURE IX.

At the last lecture I considered further the theory of Osteopathic work upon centers, and briefly, to recapitulate, these were the points I took up: First, that our operators agreed in the use of these terms, stimulation and inhibition in general, although there is some difference in the reservations they make. I also quoted from different ones of our operators to show their opinions in the matter. I then called your attention to the fact that that was not the only way, nor yet the most important way in which we considered these terms; that there are other means by which the Osteopath may command deep nerve force and blood flow, by the application of heat and cold, which, while not being distinctly Osteopathic methods, are yet at the Osteopath's command, and serve to strengthen our argument that these forces of life can be reached from the external surface by proper methods, without medication. I quoted from authorities to substantiate these points. In general, the application of heat is better than cold. I compared the effects produced upon the nerves by chemicals and by electric currents, as producing a certain change in a nerve, producing a certain change in the chemical conditions under which a nerve must be normally in order to be normally irritable, and so I reasoned that Osteopath's practice was the more rational, since he does not introduce these foreign things into the system. Further, I called your attention to the similarity of the effects of Osteopathic work upon the body, and the effects on the body of normal exercise; the difference being, in part, that your patient being sick, is not able to undergo these physical exercises, while in your

hands he is passive, and these effects may be given without the fatigue which would accompany his own exertion. To-day I continue the consideration of this subject.

I. THEORY OF OSTEOPATHIC WORK UPON NERVE CENTERS.—(*Continued.*)—The arguments advanced in the last lecture may be strengthened by quotations from standard text books. Having shown that the Osteopath, by means peculiar to his system of treatment, accomplishes results, through stimulation and inhibition of nerve action, that are as worthy of being considered normal results as those accomplished by physiologists, through methods pursued by them in experimentation; having shown further, that the Osteopath accomplishes such normal results in every part of the body, there being cases upon record to prove that that is the fact, it therefore at once becomes apparent that *the whole field of nerve-force, controlling directly or indirectly every motion or function of life, lies open to the Osteopath*; that wherever there lies a nerve of the body capable of stimulation or inhibition, it is his to command, providing only that such nerve may be reached by Osteopathic methods, either directly, as through pressure, or indirectly, as through the blood supply. For stimulation is stimulation, and inhibition is inhibition. It makes no difference in fact. I will grant that there may be a difference of degree of stimulation or of inhibition. However, having shown that the Osteopath stimulates or inhibits just as really as does the physiologist, the question of the degree of stimulation becomes a secondary one, and one relative only to the point in view. Results obtained in the cure of diseases in every part of the body, and of almost every known form of curable disease, show conclusively that the Osteopath has really stimulated or inhibited nerve force according to the end which he has in view. It would be no argument to say to an operator that he could not stimulate enough to cause a man to jump over a table. His fitting reply would be that such was not the end in view; that the end in view, perhaps, was the stimulation of a flagging circulation to restore it to its normal force and activity, and that he very readily accomplished that result. So degree of stimulation really makes but little difference to us, granted that we have gained results. I believe that there is no nerve of the body that the Osteopath may not reach by proper manipulation, either directly or indirectly, by pressure, by correction of lesion, by removal of obstruction, or by control of blood supply. What that fully means we shall see as the subject is developed.

Now, for further argument. In view of the above facts it is interesting to note the following quotations from authorities as confirmation of the claims of the Osteopath, since the authorities have made use of such means as has the Osteopath to produce effects upon nerve action.

Speaking of an experiment upon the ear of a rabbit, Kirk says: "Division of the cervical sympathetic produces an increased redness of the side of the head, and, looking at the ear, the central artery with its branches is seen to dilate and become larger, and many similar branches, not previously visible, come into view. The dilatation following section can be demonstrated in a very simple way, by pressing the nail of one finger upon the nerve where it lies by the side of the central artery of the ear." So that you see that the application of the external force, in Kirk's opinion, is equal to section of the nerve. Again, from Green's Pathology, speaking of the vaso-tonic action of the sympathetics, the author says: "The reflex process is generally due to stimulation of sensory nerves, the diminution in tonus produced being more or less accurately confined to the region supplied by the nerve. Friction and slight irritants, in the early stages of their action, produce hyperemia in this way." Thus you have another illustration of the application of an external mechanical agent, that is friction. You thus set up a reflex action. I shall consider that further when I apply this argument to work on the centers. I quote further from Howell's Text Book: "A sudden pull, pinch, twitch, or cut, excites a nerve or muscle. All have experienced the effect of mechanical stimulation of a sensory nerve through accidental pressure on the ulnar nerve where it passes over the elbow, 'the crazy bone.'" Speaking of their irritability, the same text book says: "Stretching a nerve acts in a similar way, for this is also a form of pressure, as Valentine says, the stretching causes the outer sheath to compress the myelin, and this in turn to compress the axis cylinder." This is a common mode of our treatment, as we flex the limb upon the thorax strongly in order to stretch the sciatic nerve, that being a part of the treatment, and there are certain movements we adopt to stretch the brachial plexus in nervous affections of the arm. I quote further from the same source: "A reflex fall in blood pressure is also produced by a mechanical stimulation of the nerve endings in the muscle." This, then, was a mechanical means, and the fact that we can thus work on nerve endings, which of course occur all over the body in the muscles, gives to us a fruitful field for the application of external manipulation. A little further, Howell's Text Book says: "Both the sympathetic and vagus nerve fibres have their influence over the heart decreased by cold and increased by heat." Now, having made these quotations, allow me to call your attention again to the fact that I have quoted thus fully for the purpose of showing, out of the mouths of the authorities, the fact that the blood and nerve supply may be regulated by external manipulation. I have quoted them for the sake of the argument, not for the purpose of giving license to our practice, because we demand license only from the results which we have attained. Nor by the above quota-

tions which I have made do I intend to yield a point and say that the Osteopath can attain only such results upon nerve action as is attained by physiologists by external manipulation, because I believe that I have shown that the conclusion is fair that the Osteopath can, by his method, affect any nerve in the body. Hence, I shall deem it competent to give you vaso-motor centers, etc., with the understanding that the Osteopath has a right to regard all such as legitimate objects of treatment, as his facts revert to in argument, and as his equipment for work in the eradication of disease. As I said, the more important part of how the Osteopath stimulates or inhibits is still to come, and I shall pursue this subject for a lecture or two further.*

HOW TO TREAT A SPINE.—(*Continued.*)—At the last lecture I attempted to show you how we reason and work in case the spines were separated. In to-day's lecture I wish to take up the question of how we would work in case the SPINES WERE APPROXIMATED. That is, how would we separate those spines? If, in passing your fingers down the spine you come to some place where the spines of the vertebræ are too close together, and this is a very common lesion, your reasoning in that case would be that there has been some injury at that point, to the spine, perhaps a sudden jerk or a twist, which had resulted in irritation; too much life in the form of nerve and blood force, had been thrown there, resulting in a thickening of these ligaments, thus contracting and binding those parts together. When you come to study pathology you will find that any irritation sufficient to set up an inflammation is very likely to be followed by the formation of new connective tissue or the thickening of the existing tissues. Reasoning that too much force has been directed to these parts, our work is to overcome the results of such misdirection of energy. We set about to do it largely by the same manipulation as we would adopt in the case of approximating spines, at least in the first stages. We would loosen all the parts, very likely you would find a tension in the ligaments at these points as well as in the muscles. Having loosened all the muscles, we would then spring the spines upward, getting this stretching motion that I have before described. I would work with sufficient force, according to the patient, to stimulate these parts and set up as free action as possible. You can then operate by flexing the knees up against your own body, and get considerable purchase upon such a point as that, and while it is rather a strained position for the operator, and I cannot say that it is always comfortable for the patient, it is a very good way to work, because you have your patient in such a shape that you will hardly injure him by lifting him, as I have done, fairly off of the table. By this method you may use considerable force, but of course you must not be rough.

*See appendix 4.

I spoke to you about a SMOOTH SPINE, meaning a spinal column which showed all along it that the spines were approximated and bound down close together. Now, you have a variable condition there, it may be so bound together that it will be quite rigid, or it may be capable of considerable motion, but having this peculiar smooth feeling all the way, so as to lead you to suspect some trouble. I have had a number of cases of that kind where the whole spine was in that condition, or some one particular part of it, and almost invariably there was a history of some strain, or jolting, or twisting that had set up an irritation along the spinal column, and had resulted in a tightening of the ligaments, which has resulted in the approximation of the vertebræ. In such a case the manipulation would be largely as I have shown. I would loosen first the muscles along the spine, remembering to work against the grain of the muscle, of course working on both sides. A good way to do that is by the motion I gave you with the patient on his face; you can exert considerable force, and as he is relaxed you can loosen muscles very nicely. Having done that I would proceed to spring the spine along its various parts. By flexing the knees you can spring the spine in the lumbar region, and by using the arm as a lever you can spring the spine in the upper region. Of course it is rather difficult to spring the spines between the shoulders. One good way to work there is to get the elbow against you, and work along the spine by holding and stretching, your object being to loosen all of these ligaments and to relax whatever is holding the spines together.

As to the misdirection of energy resulting in their being bound together, it may of course be entirely possible that at this present time there is not a misdirection of energy, but there has been, whether past or present, it does not make a great deal of difference. The misdirected energy may have acted for a time sufficient to thicken and perhaps to contract the ligaments, and then have been diffused to other parts of the body, so that this may be an old result without there being at present any misdirected energy or life at the point of lesion.

I would then have the patient on his back and would stretch the lower part of his spine by taking one of his limbs and my assistant the other, and working both limbs up toward the chest, thus getting a purchase on the lower part of the spine. You are not very likely to hurt the patient, but you must be careful because different people are different in that respect, and you may do considerable hurting, if not actual damage, in that way. Again, if you have such a case, you should bring traction on the spine as much as possible; and it is a very good way also to take hold of the patient by the occipital protuberance and the inferior maxillary, and to exert traction enough to draw the patient along the table. You are not likely to hurt the patient with that degree

of force, unless it be a delicate lady. Remember that you have already sprung the spine by working all along on each side. One precaution you must observe when you have the neck extended in this way, remember that the neck is less supported than the other parts of the spine, and if you should twist at that time you might cause a dislocation, the articular processes might slip out of place, so it is advisable not to turn when you have it extended. If you wish to turn the neck, do it when the spine is not under traction. In order to be thorough the treatment must be applied to the whole length of the spine, and when you had the patient upon his face you would have loosened up the muscles along the lower regions of the spine, the sacrum and coccyx. You may get considerable force by putting the knee against the sacroiliac articulation and springing the pelvis. You must relax all the ligaments, you should loosen all about it as well as further above. Remember that your work has been to loosen parts which through misdirected energy have been drawn together. When you have such a condition you may have almost any result, that is, results affecting the body through the nerves in almost any way. As a general rule, I think you will find that the results may not be marked, but may be general, and you may have a case of general malnutrition, or neurasthenia, or something of that kind.

I would set the patient on a stool, and use the motion I showed you at the last lecture, then you can get hold along the spine, generally it is better to work from the bottom up, though it does not make much difference; I hold there, bend back a little and exert traction as I ascend the column. That is a very good way. You may produce the same result and I think get a little better stretching motion by taking a turn as you work, you would be more likely then to stretch all the ligaments about the vertebræ.

In case you have a SPINE MISPLACED ANTERIORLY, you will have something which is rather difficult to deal with. In such a case you must depend largely upon the effects of the general strengthening which you give to the parts to work the spine out into its normal position, as you must in other cases also. But when you have the spine anterior, it is very difficult to get hold of the vertebra, or to influence it. However, Mrs. Dr. Patterson makes a point of getting hold of the spine as much as possible and working at it. In case of dislocations of cervical vertebræ, it is a good point to examine internally, and when the dislocation is considerable you may find a protrusion into the pharynx. In such a case, you would use not only the method I told you of, trying to reach the spine, but would thoroughly manipulate every point about it, and would spring it each way. There is one other method that I think would be helpful; that is, your spine being anterior, and going

upon the principle that we sometimes adopt of exaggerating the defect, you could bend the patient backward, and by placing the knee in the back and raising the arms above the head (you must be careful with this motion), you would exaggerate the defect, it would loosen the ligaments along the anterior part of the spine which are already stretched, and which you wish to stretch a little more in order to get the effect of the recoil, and then by relaxing and allowing the patient to bend forward again you get the recoil. Then there is another point which I think will be helpful to you; it is practically the same as I showed you. As you work along the spine, the idea is that you get the bodies of the vertebrae to move one upon the other. You get the same result as when you move your body by working your feet along the floor. I think you may very readily get such a result by working the bodies of the vertebrae one against the other.

In case there is a SPINE POSTERIORLY, what would you do? I take up these points in detail as I went over them in examination of the spine, although the method of treatment is largely the same. If the spine is posterior you would bend your patient forward to exaggerate the defect, and then you could turn him to either side and get the effects of the recoil by pushing him backward. Of course in such case you must be careful not to use too much force, and not to strain the parts beyond what they would normally stand.

In examination of the spine I spoke to you concerning the ligamentum nuchæ, and the importance it sometimes bears in our treatment of the spine, mentioning the fact that I have often found cases of headache which would yield to treatment only when the ligamentum nuchæ was relaxed. By carefully examining along the furrow just below the occipital protuberance you may find that the ligament is tense; you may find that it presents a firm resistance to the hand. The patient can also feel it by stretching the head forward; he will feel that the ligament is tense. Naturally, in projecting the head forward, one should not feel a sense as of a check rein there, but in case of cold I have frequently found it distinctly upon myself, have felt a sense of tightness along the region of the neck, and by examination with the hand I came to the conclusion that there was no other reason for the trouble than that the ligament was tense, and that was really the fact. The way to stretch that ligament is very simple. I usually flex the head directly upon the thorax, admonishing the patient to lie with his weight down, to let his weight fall against my hands, and I raise the head with sufficient force to raise the shoulders off the table. That would be a good movement to adopt in stretching of the spine when the whole spine was smooth or tense. That, together with flexing of the two knees against the shoulders, would make a very good extension

movement. In such a case of tightening of the spine it is a good idea to advise your patient to hang himself, not literally, but to catch hold of his closet shelf or the top of the door jamb, and bring the weight of his body upon his arm muscles. That would tend to relax the spine, and it is a very good way to relax the lumbar portion of the spine, as it is not so much supported by attachment to the shoulders as the upper parts of the back, from the twelfth dorsal up. I have often heard Dr. Harry Still advise some such stretching motion.

Q. When you have relaxed the structures along a smooth spine, would you give the stretching treatment at the same treatment?

A. Yes, sir.

Q. In the case of a vertebra being anterior, placing the knee on the spine, would you put it above or below the vertebra that was anterior?

A. Well, generally just about that point. You regulate your force, and I do not think you are in any danger of pushing it forward, but the general idea there is not to bring pressure upon that point, so much as to give a fulcrum against which to work, and let the general tendency of the forward motion of the spine do the work.

Q. Would stretching the ligamentum nuchæ have a tendency to get posterior curvature out between the shoulders?

A. Partly so, though we do not usually pursue that method for that particular thing. It would help.

Q. In stretching the ligamentum nuchæ forward, is there any danger of acting upon the nerves that go to the stomach?

A. I have never found any trouble in that way. I hardly think there would be, unless in case of defect, as you thus stretch the whole spine, you might get an effect upon the splanchnics.

Q. In case of anterior displacement of the 4th cervical, would the stretching of the ligamentum nuchæ have a tendency to draw it out?

A. It would not have much of a tendency to do that. It is true there are slips that run down to those vertebrae, but you would hardly get enough tension by those slips to bring tension upon the vertebrae.

Q. In separation of the spines there is a weakness of the ligaments, and in approximation there is tenseness, and our treatment seems to be very much alike, how do we know that the same treatment will cause an opposite effect?

A. That is a good question. There is a certain lesion, in one case there is an approximation, in the other a separation; there would be no trouble in diagnosis. You must not misunderstand the use of the terms, too much or too little life directed to a point. That is true, but there may be exceptions, in case of a sudden wrench or jerking of the vertebrae apart, which frequently happens, there would not necessarily be a relaxation of the ligaments. But that is a general method of reason-

ing; I have mentioned it for the sake of its importance. But as to your question how we could get the different effect by practically the same treatment, it simply amounts to this: that in each case you are trying to stimulate parts; in one where there is a tightening of the ligaments you use a stretching motion to draw them apart; in the next case where they are separated, granting there is too little life there, you wish to stimulate them by stretching them, and getting the benefit of the recoil and throwing more life to the part.

LECTURE X.

At the last lecture I brought out the point that from the preceding arguments, it became apparent that the whole field of nerve force was open to the Osteopath, and that the probability was that there was no nerve in the body which he could not affect either directly or indirectly, thus opening to him the whole field of nerve life. That the question of degree of stimulation was not an important one, since the Osteopath manifestly could stimulate or inhibit, that is, could affect the nerve in such a way as to gain the desired end. I then quoted certain texts from Kirk concerning an experiment upon a rabbit's ear, section of the nerve followed by vaso-dilatation of the ear, he showing that the same thing could be done by pressure of the thumb nail upon the nerve; also a quotation from Greene concerning the reflex process being generally due to stimulation, which might be applied mechanically. The general idea of those quotations being to show that we could from the books get authority for what we have been arguing; that that did not limit us, since we have shown that we can get results in every part of the body; hence, we are not limited to the same kind of experiments as the physiologist when he gains results by external experimentation, but since we can reach the whole body, we are privileged to say that we can stimulate the nerves in any part of the body. To-day we continue the same subject.

I. THEORY OF OSTEOPATHIC WORK UPON CENTERS.
—(Continued.)—The subject grows under my pen, and I do not know but there will be several more lectures before we shall have concluded the subject. I have been calling your attention to the fact that the view I gave you of mere stimulation or inhibition, direct or indirect, was not the important thing that the Osteopath considers when working upon nerve centers. I have reserved that until now, calling it the second view taken by the Osteopath in regard to stimulation or inhibition of nerve action. This is that *by the removal of lesion, some obstruction which*

has been preventing the direct flow of the blood or nerve force, the tendency toward the normal is left free to act. That is the kernel of our work, I believe. Not that we do not do the other things, but I wish to lay stress upon the fact you must look for lesions, and having found the lesion and having removed it, you do not have to stop to consider whether it is stimulation or inhibition that you must produce. After you have the lesion removed you have the ever present tendency toward the normal to regulate the activity, and leave Nature to do the work. In case the lesion or obstruction had been such as to inhibit nerve action or lessen the conductivity of the nerves, and thus prevent the proper conduction of nerve impulses, and you remove that lesion, the result would practically be stimulation. For instance, you might have had the tightening of the spine along the region of the upper splanchnics resulting in an impingement upon the branches connecting with the sympathetics in that region, thus interfering with the nerve force to the solar plexus and to the stomach. The result might be a case of dyspepsia. There you have an inhibition of nerve force; you have not enough life to digest the food put into the stomach. When you have removed that obstruction, what have you done? You have taken away that obstruction, you have left Nature free to act, and she will go about stimulating and renewing the nerve force at that point. What you did was to correct the lesion, you did not stimulate nor inhibit, you did not care about that particular point in your treatment. On the other hand, if the lesion has been just sufficient to bring irritation upon the nerve and to keep it stimulated to an abnormal degree of activity, that is what you would call abnormal stimulation of the nerve, then by removal of the lesion, you would obtain the result of inhibition. That is, you would remove the irritation, leaving free the tendency toward the normal to act, and the result of Nature's work would be a quieting of the nerve, and thus a cure. You have simply corrected the lesion. A very familiar example of such a condition is seen in female troubles; you may have a uterine tumor affecting the hypogastric plexus, irritating the kidneys. If that tumor is taken down or removed the result would be inhibition, but you have simply corrected the lesion. This is the most important thing that the operator does; he removes lesions in the great majority of cases. The lesion may be lack of nutrition; that is, of blood-supply to the nerve; it may be a displacement of some important part, bringing direct pressure upon the nerve. No matter what the lesion be, the Osteopath's knowledge of anatomy, and his trained sense of touch enable him to discover abnormalities in anatomy and gives him his peculiar adaptability for the treatment of disease. I do not know that it is because we are any wiser than physicians, because I do not think we are, but it is because our system differs from others radically. We look at disease

from an entirely different standpoint. I hope later to take up that subject, the different systems and schools of medicine and their *modus operandi*. The result of our method is that we make a correct diagnosis of the case. You remember that Dr. Hildreth put especial emphasis upon that, stating that the strong point of Osteopathy is that we make a correct diagnosis, that we diagnose from a physical standpoint. In many cases the Osteopath diagnoses and removes some displacement, hence the importance of looking for the lesion in every case. To illustrate the difference between the position taken by our medical friends and our position: when I was visiting at my home about a year ago, a young man called on me to be examined. It was the same old story of a dislocated hip, the leg being shorter than it ought to be by about an inch, and there being a tumor upon the side of the sacrum, made of course by the protrusion of the head of the femur. Now, he told me how the doctor had examined him, simply by settling him on the other side of the room and questioning him. That illustrates the difference in our methods. You will find that in your practice, there will not be a month pass but that you will find some similar case where the doctor has simply sat across the room and questioned the patient, and has not made a thorough physical diagnosis. So if you will take the trouble and will thoroughly acquaint yourself with texts on physical diagnosis, I think you will be amply repaid.

By quoting from the operators in the building I wish to show that they believe that we reach centers and affect nerve force directly by the removal of lesions. I quote first from Dr. Hildreth; "In the first place, where a lesion may exist, by manipulation or rather by Osteopathic treatment, you reduce the lesion, you re-establish a natural circulation, and in so doing you carry away any obstruction which may exist. You thus remove the obstruction to nerve centers. If there be a contracted condition of muscles, the dislocation of vertebræ, or recent injury of tissues, sometimes without dislocations, all these conditions may produce disease of the different nerve centers of the spine, and the effect of Osteopathic treatment in all these conditions is to help to re-establish a natural nerve current, thereby restoring a normal condition of circulation, thus relieving all tensions on nerve centers. With this done thoroughly health cannot help but follow, for a healthy condition is a natural condition."

Thus you see that Dr. Hildreth's idea is that the Osteopath adjusts abnormalities existing in the anatomy and leaves Nature free to restore a condition of health. I wish to add this to what Dr. Hildreth has said; in some few cases you will find that all that is necessary to do is to stimulate the blood supply. The blood supply acting through a longer or shorter time removes the lesion. What you have done in that case

was not to remove the lesion, but you have stimulated the blood supply, which you have done through direct manipulation of the nerves controlling circulation. In that case the matter is reversed, the cart before the horse. You have to do this in the case of rheumatism, where there are deposits in articulations. That, of course, is not a primary lesson, but it is a lesion. You must stimulate the blood flow so that it will absorb those deposits. We sometimes absorb small abscesses, or thickening of parts in that way. You first remove the primary lesion, and then the secondary result has been to remove the other lesion. Of course we cannot always bring facts down to fit theories.

I quote further from Dr. McConnell; "Our Osteopathic work is largely performed in correcting lesions involving nerves or nerve centers, also in correction of the lesions of the arterial, venous, lymphatic, and other fluids that bear a relation to such centers. In some few cases we simply correct lesions of nerves passing from or to the brain, or the cord, or sympathetic chain, or to the organ affected." You see that Dr. McConnell's idea is that we work upon nerve centers, but that we do it by affecting either the fluids of life or the nerve forces of life. His idea being that we remove lesions, as his words imply. He also says that we sometimes work to restore organic activity or health by removing a lesion from a nerve, that is, independent of its center. That is, you may have a pressure upon a nerve, and removal of that lesion may not affect the center. From Dr. Turner Hulett I quote as follows; "Pressure upon a nerve fiber would cause a break in the continuity of the semi-fluid axis cylinder and the damming back of its current upon its center of supply. If any abnormality exists, then the ever present tendency toward the normal will tend to restore normal conditions. If the previous condition was abnormal stimulation, then inhibition or desensitization was accomplished; if it was sub-normal, then stimulation was accomplished." This expresses very nicely what I have tried to show you, that whether you stimulate or inhibit depends upon the nature of the lesion that you remove. I might quote further from other operators, but lack of space forbids. I hope this subject is not growing threadbare. We hear a great deal about removal of lesions and stimulations, etc., and perhaps you get a little tired of it, but I think it important to get these things correlated in some definite system of argument, so that we may have together the points relative to Osteopathy.

We have thus answered two or three questions propounded. First, what does the Osteopath mean when he says he "stimulates or inhibits?" Second, how does he affect internal life by manipulation upon the outside of the body? and we have partly answered the third, How does he affect centers? I have taken this up in detail because these questions are some of the most bothersome to the young Osteopath, and to the

older ones as well sometimes, and if you are prepared with arguments, you may retain many a patient by explaining these things to him in a logical way.

Now, as to how we work upon centers, I wish to carry the argument a little further. From what I have quoted from Doctors Hildreth, Hulett and McConnell, you see that they believe that we work upon centers; first, by the removal of lesions or obstructions, and, second, by direct stimulation; and there is no doubt that we do affect centers. What I have quoted from them was given to me in reply to the question, "How do you affect centers in the spine?" I wish to call your attention to the fact that the conclusion is inevitable from what has been said that we must reach NERVE CENTERS, not simply nerves alone. Certain facts which we show bear out this conclusion. Speaking of the sympathy between the area that is supplied by the fifth nerve and the area which is supplied by the vagus nerve, Dr. Jacobson, Dr. Hilton's editor, says: "This sympathy is an example of a reflected sensation in which the connection between the nerves concerned takes place in the *nervous center*." Thus you have your effect running up one nerve, through a brain center, and down another nerve. Now, if you have a lesion affecting the periphery of one of these nerves, and you remove that lesion, you have naturally affected the center in the brain; there is no doubt whatever of that. He gives a case of obstinate vomiting in a child, which was cured by simply removing from each ear of the child a bean which had been introduced in play. There was a stimulation of the fifth nerve; the impulse must have gone through the floor of the fourth ventricle, out over the vagus to the stomach. Of course there is a connection of the fifth nerve and vagus by means of the sympathetic, but it is indirect, and it is probable that the brain center was the connecting link, as Dr. Jacobson says. Removing the bean reacted upon the connected nerve through this center.

Again, we must reach nerve centers by the very definition of reflex action, which we know is an action caused by an impulse sent back along a nerve to a center and then out. From its very definition, if we cause reflex action by manipulation, the inference is inevitable that we affect centers. That we may do this is shown in performing the experiment for the tendon reflex. This is very easily done by crossing the leg at about right angles and then getting the reflex by tapping the tendon. That is a reflex action. You have sent the impulse from the nerve endings in the muscle back to the center in the cord which governs the nerve supply of the muscles of the limb; the gluteal muscles have contracted and thrown the limb up. So you have affected the center. Again, every time we set up a vaso-motor action we have probably acted upon a center. Howell's Text Book says that the vaso-motor nerves

can be excited reflexly by afferent impulses conveyed either from the blood vessels themselves, or from end-organs of sensory nerves in general. The thing is proven the moment you show that vaso-motor actions are reflex actions. I have instanced here the bleeding of the nose, epistaxis, stopped by irritating the superior cervical ganglion of the sympathetic; simple stimulation of the neck at that point has stopped bleeding of the nose. The conclusion is that you have acted through a nerve center.

I have shown FIRST, that we affect a nerve and its area of distribution directly, instancing the result of pressure of the ulnar nerve where it crosses the "crazy bone", so-called, thus you have numbness in the hand; you have affected that nerve in its area of distribution directly, not through a center. SECOND, we affect a center by removal of a lesion, the beans in the ear being the example cited. And THIRD, we affect a center without removal of lesion, but by the effect upon the nerve, as in the ear of the rabbit, there was no lesion removed when we press on the nerve, we acted on the nerve back through the center and got our effect. Those are at least three different ways in which we may affect nerve action.

II. HOW TO TREAT A SPINE.—(*Continued.*)—I have examined this gentleman and find the curves of his spine are not normal. What I wish to do is to work inward this curve in the lumbar region, and to make more pronounced this curve in the upper dorsal region, because it is flattened, while the other is drawn out a little posteriorly; thus you have a somewhat straight spine. At the risk of being tiresome, I bring these points up in detail as I took them up in examination of the spine. I think you know what to do here as well as I. I have shown you how to approximate or separate vertebræ, and you would treat by a combination of the methods I have shown you; the relaxation treatment with the patient on his face, or springing of the spine all along; the relaxation of the ligaments and muscles, and thus of the blood and nerve force to those parts. By a combination of these treatments you would tend to strengthen the normal curves. You would thus remove the lesion, which would be the tightening or tension that had thrown them out of their normal curves, and would leave nature free to act. You cannot quickly replace those vertebræ in their normal curves; you must strengthen gradually and build up the spine in order that it may take its normal position. This tendency toward the normal is of great use to the Osteopath.

You may find the coccyx in almost any position, either anterior or to one side. What you must do is to give a local treatment. The method of digital treatment is to first place the finger along the curve of the coccyx, and by working from side to side to free all the ligaments and tissues thereabout. In this way you loosen everything over the foramina

where the nerves emerge, or any binding down which may have occurred over the nerves directly. You have inserted the finger and have turned it so that you have worked every side; you must thoroughly relax before attempting to reset. This must be done not only internally, but you must thoroughly relax all the muscles externally. It will take some time, but you can at each time you treat the patient bend the coccyx toward its proper position. Of course there are lesions of the coccyx which may be set immediately. In general, it is recent dislocations that yield thus quickly to treatment. When it is chronic, as it usually is, you will have to go slowly. Suppose the coccyx was tending to be slightly curled, as is frequently the case, you must spring it backward each time. You must go according to the conditions, and must constantly spring the spine toward its proper position. I explained the troubles which may follow this displacement, and I do not need to take them up now.

The SACRUM may be anterior or posterior. I shall consider that more in detail when we come to the consideration of the pelvis itself. But, supposing it was posterior, we would at first loosen all the tissues, muscles and ligaments, and then adopt the method I showed the other day—get your knee before the bulging portion and spring it inward, a direct application of the treatment to the displaced part. It is a good deal like putting a coccyx back into place, by training it in the way it should go. Now you may also get the same motion that I showed you and spring the sacro-iliac articulation in this way. Then have the patient lie on his back, and you can get a very good motion for the sacrum in this way; your hand is placed in this position, the knuckles forming one fulcrum and the tips of the fingers the other; there are two fixed points; you have the ends of the fingers placed against the sacro-iliac articulation, and your knuckles against the table. You thus have two fixed points, and you can in this way relax, by an upward, downward and outward motion of the limb, all the muscles and ligaments. The weight of the pelvis is upon those two fixed points; it gives a considerable spring, and is a very good motion. In case the sacrum is anterior, of course it is very hard to apply any direct treatment to it, but use the motion I have just shown you; stimulate and relax every part, and depend on the tendency toward the normal. You might, by getting pressure upon the side of the pelvis, spring down, but I doubt if you could do much in that way. Your tendency, however, would be to approximate the innominates and to cause it to bulge out.

LECTURE XI.

At the last lecture I continued the consideration of the theory of Osteopathic work on centers, calling to your attention the second view taken by the Osteopath as to how we stimulate or inhibit nerve action, the idea being that as a rule we remove some lesion, and that that is our strong point in diagnosis—to find some lesion which we may reduce to the normal, and thus, if the tendency before was toward stimulation, you have removed the lesion and allowed nature to tend toward inhibition, and vice versa. You do not have to split hairs over the question as to whether you employ a certain motion to stimulate and a certain other motion to inhibit. That is, as far as lesion goes, you have removed the lesion. I quoted from different ones of the operators to show that that was the view generally held. I also called your attention to the fact that sometimes you stimulate blood supply to remove the lesion, which, although secondary, is still a lesion; as, for instance, we stimulate the blood and nerve force to remove deposits in rheumatism, and to cause absorption of abscesses, and things of that kind. I had answered two questions propounded and partly the third, as to the effect we have upon nerve centers. Then I went further into the question of how we might affect centers, bringing to your attention the fact that the quotations I made from the operators were given in response to that question, and one way was by the removal of lesions. Another way was that in any manipulation of the nerve we must very likely affect centers, as, for instance, in getting a reflex effect, because from the definition of reflex action we must have affected the center, and we often produce reflex action by work upon a nerve, not a center. I instanced a case of obstinate vomiting produced by the irritation of beans in the ears. The fact that you have removed the vomiting shows that you reached the center; that you worked through a brain center; up one nerve and down another nerve to the periphery, to the organ supplied by the nerve. The fact also that we can produce vaso-motor action shows that we have affected centers, since vaso-motor actions are essentially reflex. Thus I showed that we may affect a nerve by three ways: 1st, we may directly affect it and its area of distribution by direct work; 2d, we may affect the center by removal of lesion to the nerve; 3d, we may affect a center without removal of lesion, as when we produce a reflex action. To-day I continue the same subject.

I. THEORY OF OSTEOPATHIC WORK UPON NERVE CENTERS.—(*Continued.*)—In the December issue of the Journal of Osteopathy, a theory was given in an article by Dr. Lawrence M. Hart, one of our recent graduates, which I think was worthy of notice. It was well received at the time I believe, and I have thought that it con-

tained points which would be worthy of our consideration this afternoon. His idea is that we always remove lesions. His theory, in brief, is this: That contractures of muscles occur along the spine. These contractures along the spine, he says, act in a way to mechanically shut off the blood supply in the branches supplying the spinal muscles themselves, collaterally producing a hyperemia in the blood vessels running to the cord, and in that way stimulating the nerves, irritating them, and thus leading to inhibition, the final result always being an inhibition, and the lesion always being contracture. There are certain points with which I do not agree. I will call those up later, but I will go over the reasoning that he has followed, bringing out his points. In the first place, he says there are two ways in which a nerve may be affected through its blood supply, and that is true. In the first place, you may have anemia of the nerve; that is, lack of blood supply, robbing it of its nutrition and leading finally to a degenerated nerve, and paralysis of the part supplied follows. In the second place, you may have hyperemia of the nerve, which he claims leads to an irritation, there being too much blood thrown to the part, leading to abnormal activity; this leads to too much stimulation, resulting in inhibition. In one case from anemia and degeneration you have paralysis; in the other case you have practically the same, an inhibition which is likely to be more temporary, because it is produced by an over-supply of blood and not by starvation. Thus you see that his argument leads always to the one result of inhibition. He calls our attention to the distribution of the blood supply to the spinal cord, showing how the branches from the vertebral, intercostal, lumbar and other arteries in their respective regions run to supply both the cord and the spinal muscles, the same branch supplying both; that is, dividing to supply both, the posterior division running to the spinal muscles, and the other division running to the cord and its membranes. He shows the close relation between the blood supply, and states the fact that from the occiput to the coccyx all of the muscles and parts of the cord are thus supplied. Now, his argument is that in contracture of muscles, the lumen of the vessels being thus practically closed, the over-supply of blood is sent through the branch which supplies the membranes of the cord, thus producing a condition of hyperemia about the cord. In the first place, this would result in throwing too much blood supply to the nerves in question and the nerve centers of the cord; the result would be that by over-blood supply there would be over-stimulation, leading finally and naturally to an inhibition of nerve force, and thus you see there would always be inhibition. Now, in relieving this condition, we of course take away the lesion; we, by our methods, relax these old contractures, and allow a return of the flow of blood through them, and thus take away the overplus which is being misdirected to the

cord and, through the centers, affecting other parts of the body. You see that the point is made that we remove lesions and that is one reason why I bring this up. Whatever the result, according to his theory, if I correctly understand it, we have always stimulated; but since we remove lesions and then leave nature to work, it is not an essential question to us whether we stimulate or inhibit, which is another good point, because there has been a good deal of hair-splitting as to whether you should give a certain twist to stimulate, or a certain other twist to inhibit. Now, to me, Dr. Hart's theory is valuable in bringing prominently to your attention this one kind of lesion, contracted muscle, and showing the probable effect produced. This is at least one kind of lesion with which we have to deal. He shows the importance which we must attach to this condition of contracted muscle, which we frequently find along the spine. I doubt if there will be a day in your practice in which you will not find such a condition along the spine. In the criticisms I have to make, I do so not to criticise the article, but simply for the purpose of bringing out the points which I think will be helpful to you. From his article I do not gather that he allows of other lesions, though perhaps I am mistaken. I do not think he makes it general enough. Now, there are a great many other lesions along the spine which will affect nerve-centers and nerve-distribution, and saying that contracture is the only cause of lesion is far from correct. So that his theory is true only when the lesion is in the nature of a contracture; and then I do not agree with the explanation, but I shall speak of that later.

I wish to call your attention further to the fact that we sometimes stimulate and sometimes inhibit. After you have removed the lesion, you sometimes have to do your Osteopathic work upon parts affected, and in those cases you must stimulate or inhibit. In the case of headache we frequently have to hold and, as we call it, inhibit centers in the neck, while in the case of epistaxis we would stimulate the superior cervical ganglion. Then, again, to remove the chalky deposits in rheumatism, or in absorbing an abscess, we have to stimulate frequently, and in that case, of course, it is not a matter of removal of lesions. Now, I have said that I think the explanation of the effects following contracture is only partly true, and for this reason: I believe the theory is somewhat too mechanical, making this a mechanical shutting down upon blood supply, and thus sending an overplus to other parts. The theory does not, according to my mind, take into consideration enough the mechanism of nerve-distribution to the vessels and to the muscles of the back. Hence, I have gone somewhat further, and have endeavored to explain the conditions which would follow contractures on the theory of nerve influence. I believe that the generally accepted view is that

not only the blood vessels of the body, but all the functions of life, are directly under control of the nervous system, sympathetic or cerebro-spinal. I think it would be more in line with the accepted theory if we could explain these things according to some theory of nervous influence which they have produced. Now, it is reasonable to suppose that there is by contracture some vaso-motor influence set up. Mechanical contraction would result in overplus of blood to the cord and its meninges through the collateral branches. That would be inevitable, but that condition would hardly be permanent unless the vessels were dilated to accommodate it, so that we must look for some sort of a nervous action to account for the blood remaining at that place; otherwise the blood would be distributed about the body, and the collateral equalization would be set up, and, as you had anemia along the spinal muscles, you would have that much more blood in other parts of the body, not necessarily just along the spine; that is, in case the mechanical theory holds true. But I believe you might have in such case not only hyperemia of the cord, but you might have anemia of the cord and its centers. If the muscles contracted and shut off the blood supply mechanically only, you cannot have anything but hyperemia; but if our theory according to nervous mechanism is correct, you can have either. There is no question that contractures are important lesions. For instance, we have heart troubles caused by lesions along the back. I remember having heard Dr. Hildreth say that in case of weakness, general debility, and irregular heart action, he always looks on the left side between the shoulders for some contracture of muscles in that part, and that such a condition would usually make the patient despondent. Dr. Hildreth also said that when he found such a lesion on the right side of the spine it usually had the opposite effect. Such is Dr. Hildreth's explanation of this kind of lesion along the spine, and there must be some good explanation for the results thus produced. Now, to me it seems very probable that the contractures act not so much mechanically as through vaso-motor centers and fibres which they involve, and not only that, but indirectly through the nervous mechanism of the muscles involved. I quote from Gowers on the Nervous System: "The sensory nerves of muscles have been shown by Tschirjew to commence not in the muscular fibres but in the interstitial connective tissue." Then he goes on to explain his theory of why we get a "myostatic reflex" action, the term he has adopted for "tendon reflex." He says that in such a case the muscle is upon a tension. In showing you how to produce the knee-reflex, I crossed the knees, thus bringing tension on the muscles above the knee; then if you shock the muscle, not necessarily the tendon itself, you get the throwing out of the foot. He bases his theory on the sensory nerve-endings between the muscle fibres being impinged upon

by the fibres themselves. It seems reasonable to suppose that if the muscle is in a state of tonic contraction there would be a pressure upon the nerves, and that is a fair explanation of the sore spots we find along the spine. Those sore spots have been started in a contracture. It has become axiomatic that we must look for the sore spots along the spine, and you will find that they coincide with the seat of the lesion, which is the contracture. That theory would account for the spot being sore, that is, providing it had not been of too long standing, in which case if you find it not sore, you might account for it by the same theory—that stimulation has gone on until it is equal to inhibition. I am a good deal like Dr. Hildreth when he says, "If this theory does not suit you, figure one out for yourself." While I am endeavoring to explain these things in as scientific a way as possible, if my theories are not correct, it is your privilege to do better.

Now, not only would we affect the terminal sensory fibers in the muscles, but we know that there is a close connection between the spinal nerves and the sympathetics, and it looks very probable that an effect might be sent from a muscle through its sensory terminal to affect the sympathetic nerves, and thus to affect the general sympathetic life, irrespective of any effect you might have through the blood-supply upon nerve centers in the spinal cord. Thus you get the direct sympathetic effect from the irritation of sensory nerves. I quoted from Howell's Text Book a few days since to show that nerves were frequently stimulated through their sensory terminations in the muscles. Now, as I have said, I believe this contracture, taking the theory that it acts through the blood-supply, may thus produce either vaso-dilation or vaso-contraction, according to the centers affected along the spine. I here quote from Kirke; "The vaso-dilator nerves in part accompany those first described, but are not limited to the out-flow from the 2d thoracic to the 2d lumbar." Further; "The vaso-constrictor nerves for the whole body leave the spinal cord by the anterior roots of the spinal nerves from the 2d thoracic to the 2d lumbar." My argument is that since you have both vaso-dilator and vaso-constrictor centers along the spine, according to the quotation from Kirke; that acting on the center affected you might have either a vaso-dilation or vaso-constriction; you may have anæmia or hyperemia of the center involved. That looks reasonable to me from the theory of nervous mechanism of the blood-supply. In case the lesion were such that it brought this overflow of blood upon a vaso-constrictor center, that center would be stimulated at first, and the first result would be to shut off the blood to the parts affected by the contraction, resulting from the over stimulation of that vaso-constrictor center. Thus you might have anæmia; the constrictor may act in such a way as to entirely shut off the blood

from a part. Byron Robinson is authority for the statement that the sympathetics may crowd the blood from a part even unto death. However, suppose that the action has gone so far that the stimulation has resulted first in irritation, then in inhibition, so that there is a paralysis there, then your constriction is lost; your dilators are not opposed and there would be a flooding of the part; a hyperemia. In line with this theory I quote what Green has to say. He says that hyperemia of a nerve center leads to, first, an excessive nervous excitability, together with paræsthesia of sight and hearing, and finally may even lead to convulsions.

On the other hand, if in the first place the vaso-dilator center be affected, you have the dilators over-stimulated, resulting in hyperemia, but when it went on, finally resulting in paralysis of those dilators, then the unopposed action of the constrictors would set up an anemia, and that would be a permanent result. It would lead to death of the part paralyzed from the excessive anemia of the spinal centers and the spinal nerves. Thus you get an effect not only upon the spine, but upon the whole distribution of that nerve. You can see what would be the probable effect of anemia or hyperemia of the cord, either from this shutting down of the contractures upon the blood-supply, according to one part of the theory, the other part of the theory being that this contracture might shut down directly upon the nerve and through it send the effect to the part supplied by the nerve. Thus you see that contractures along the spine may act as stimulators or inhibitors mechanically. So in this case we remove the lesion for its own sake, and not simply to stimulate.

So much for that thought. I wish to take up another question in relation to blood-supply, how it affects nerve life, and how, perhaps, the Osteopath may thus influence nerve-life through blood-supply. That is perhaps getting the cart before the horse, according to the previous argument, still from the facts which I wish to bring to your attention, it looks as though we might accomplish this. This question is not proven, but I thus throw it out for the sake of suggestion. It may lead to a good theory later. The quantity of natural, healthy blood in the vessels of a part acts reflexly upon the mechanism, that is, the vaso-motor nervous mechanism, and thus affects the parts. There would thus be a collateral equalization of the blood throughout the body. As I stated, the facts that I have to give along this line do not strictly prove the point, and I have not tried to make them do so, but they are valuable as hints. In the first place, if Dr. Hart's argument be true that the effect of the blood may be stimulation resulting in inhibition, or that it may be inhibition direct, then the quantity of the blood in a part, being drawn from the spinal muscles to the centers, the mere

quantity of blood would account for the effect upon the nervous mechanism. I use the term, pure, healthy blood, because I do not take into consideration the question of the effect of deteriorated blood, which you know is a different thing. From Green's quotation we see that he considers the effect of hyperemia upon nerve centers to be paresthesia, convulsions, etc. Howell's Text-Book states; "There is in some degree an inverse relation between the vessels of the skin and of the deeper structures, by the reflex mechanism of the vaso-motor centers." If superficial parts have their vessels dilated, deeper parts have them contracted, the flow of blood being regulated in different parts of the body according to conditions. The question is, what is the stimulation? There was one of our students who conceived the idea that the fibres of the solar plexus distributed upon the blood vessels close to the heart, chiefly upon the aorta, were stimulated by the flow of blood from the heart into the vessels; that they thus acted as vaso-constrictors or dilators, and propelled the blood, producing the rhythmic beat of the aorta. This student wrote to Bryon Robinson, who replied that he considered it a very reasonable theory. Hence, you may have the quantity of blood thrown into the aorta acting as a stimulant. Green further notes the fact that in hyperemia following inflammation, in other parts of the body there is collateral anemia, because there being too much blood in one place, there is too little in another place. As I said, I quote these facts as suggestions, and not for the sake of proving the theory, but if that theory can be proven, it will be important to the Osteopath; he may mechanically pump blood into a part, as for instance by flexion of the thigh; he might repeatedly flex it and pump blood into it and thus get a vaso-motor effect which is mechanical. Thus, he may get a nervous effect through the quantity of blood sent to the part. We sometimes make a practical application of such a theory by working upon the splanchnics to reduce the amount of blood in the head; the parts governed by the splanchnics being a sort of a reservoir for an over-plus of blood, and we send it from one part to another.

II. HOW TO TREAT A SPINE.—(*Continued.*)—As to the second part of my lecture, I shall try to conclude this subject if possible. There is one point I want to give you in relation to the general treatment of the spine. When you have acute hyperesthesia, an acute tenderness all along the spine, Doctor Still treats in the neck, in the cervical enlargement, corresponding to the spines of the cervical vertebrae, and in the lumbar enlargement of the cord corresponding to the spines of the last three or four dorsal and the space between the 12th dorsal and 1st lumbar.

There is one treatment that I have not shown you. It is a treatment in which the operator simply brings his weight to bear in this way; He

kneels upon the table, one knee upon either side of the patient, who is lying on his face, and presses downward with thumbs or palms. That is what I have denominated the "straddling treatment."

I mentioned to you that we frequently get sounds along the spine which are due to motion between parts, and in some cases that that was due to a slipping of the ribs to their place, and when I have worked along the spine by getting direct pressure over one side only, and have not been able to produce these noises with their accompanying result, it was probably because I did not get equal pressure upon both sides, but when I adopted this "straddling movement" it brought equal pressure on both sides, then I could get that sound and the good effect following the replacement of the parts in that way.

I might call your attention to the technique of stretching some of these SCAPULAR MUSCLES. You will, in your treatment of the upper part of the spine, either to reduce contractures, or to loosen the muscles along the spine, find that you must stretch these scapular muscles. It is a good plan to push the patient's arm well down to the side on a level with the table, then, putting the hand beneath the scapula until the fingers are over-lapping the spinal edge of the scapula (the shoulder blade has been approximated to the spine), there is not much space between the spine and the edge of the scapula. By holding the muscles firmly against the edge of the scapula you can stretch so that by bringing the arm across the chest you bring a tension upon the scapular muscles. By the use of the thumb on the scaleni muscles at the side of the neck, bringing the arm up over the head, with your thumb over those muscles you can loosen them, this being a preparatory step to the setting of the first and second ribs. You must have those muscles relaxed, and you get the effect in this way as well. Just hold them with one hand while you push the elbow up toward the head and around toward the body. Those are motions frequently employed in practice.

There is a question now as to how to reach the PSOAS MUSCLE. It is one of the flexor muscles of the thigh. It is a good plan to straighten the legs out and then bow the back forward at the lumbar region; that gives it some little stretch and effects the psoas muscle. The lumbar plexus is formed in the substance of the psoas muscle, and if it is contracted you may have trouble with that plexus.

I want to show you one other motion which it is sometimes necessary to use, though with great moderation. I show it to you principally to warn you against its use. The patient lies on his face and you lift the legs from the table and then work from side to side; you can thus stretch the psoas muscle often more than you did before, and by working upward along the spine, one operator placing his hand on one side of the vertebræ, the other on the other, you can thus bring pressure

against either side of the vertebræ. This is the treatment called "BREAKING UP THE SPINE." It is frequently used with very good effect in cases of diarrhoea, flux and other troubles. The warning is that you should not raise the knees high above the table; if you do that and bow the back too much you may have serious results, and Doctor Still has cautioned us against any such performance, so you must be extremely careful, though the motion is useful in reaching certain troubles. You might not only strain the spine and the anterior ligaments, but you might tip the parts of the pelvis. Dr. McConnell spoke of a case which had been injured in that way, and which has been serious ever since; he said he had found that the innominate bones had been slipped, and that there was an inequality at the symphysis of the pubes.

LECTURE XII.

I wish to recapitulate a little in regard to the eleventh lecture. At that time I brought up the theory of work upon a spine through the effect we could get by removing lesions in the shape of contracture of muscles. I referred to Dr. Hart's theory, his idea being that contractures of muscles shut off the blood supply in the muscular branches of the arteries, and the overplus is thus thrown to the cord and affects centers and nerves, stimulating at first, but afterwards leading to inhibition. I explained how his view led up to that result. I then went further and endeavored to show that such a process must necessarily be by affecting vaso-motor nerves, otherwise the blood would not be retained about the centers of the cord to influence them. And further, that we might have an effect not merely upon the vaso-motor nerves and their centers, but we might have an effect directly through the terminal sensory branches, running from the muscles, upon sympathetic and internal life. I then brought merely to your notice, without attempting to prove it, the point that possibly the amount of blood in a part would account for certain nervous effects. Then, again, the theory of Byron Robinson, that the pumping of the blood from the heart into the aorta may set up a reflex action. And finally the quotation from Green's Pathology that there was always a reflex relation of the circulation, that if the superficial vessels were dilated, the deep vessels were contracted, and vice versa; and from these and other facts it seemed probable that we, by working mechanically, as for instance pumping blood into the limb, bringing a certain quantity of blood to act upon nerves, could influence nerves and centers.

I. THEORY OF OSTEOPATHIC WORK UPON NERVE CENTERS.—(*Continued.*)—I wish to continue the same general subject to-day, going a little further into the question of CONTRACTURES; THEIR OCCURRENCE, NATURE AND CAUSE. Now, as to the occurrence of contractures along the spine and in other parts of the body, their importance, I think, was fully brought out in the last lecture, in showing you how important they become when considered as lesions along the spine, especially from an Osteopathic standpoint. We, as Osteopaths, find a great deal to say about contracted muscles, and we are backed by the authorities when we are talking about them. When we tell a patient that there is a muscle in his back or neck which has become contracted and failed to relax, he is sometimes inclined not to believe it, because the popular idea is that a muscle contracts and relaxes when you wish it to, and that it cannot contract and hold on. You will also find that when you get out among the medical fraternity they will try to pick flaws in your argument, and unless you are backed up by authority, you hardly feel so strong in argument as you otherwise would. Hence, I have taken up this question a little further to show that what are termed "contractures" are recognized by the different authorities. Howell's Text Book says, "A contracture is a state of continued contraction of a muscle." Gowers on the Nervous System says, "Tonic spasm, persistent and involving only a certain group of muscles, causes distortion of the parts to which they are attached, and is termed a contracture." In the Journal article which I quoted at the last lecture a quotation is made from Dr. Allen's work on Human Anatomy, which is as follows: "An abnormal phase of tonicity is met with when a muscle sustains unduly prolonged action of its fibers; under these circumstances a shortening of its belly takes place, which persists as long as the cause of the contraction is maintained. Such abnormal modification of contraction is termed contracture. Stretching of a contracted muscle is readily accomplished and maintained, provided the cause for the contracture is removed. Contracture, clinically considered, is a subject of great importance. In lateral curvature of the spine contracture of muscles will take place on the side of least curvature." Hence, you see that the authorities agree; they say that contractures are of considerable clinical importance; they say that they cause distortion of parts to which they are attached. Others besides Osteopaths attach significance to this congested condition of the muscle which we call contracture.

But it is important, perhaps, in taking up this subject, to show that the Osteopath, in work upon contractures, in treating them as lesions, and in removing them, is thoroughly scientific and has the weight of authority and science behind him. There is a question as to what the nature of a contracture is. We saw from the quotation above that Gowers understood

it to be tonic spasms; then Howell's Text Book says that continuous contractions may be caused by continuous excitation, and it regards it as a tetanus. Such a condition may be found also in involuntary muscles. When you are in practice you will find that frequently in your work upon the intestines they are drawn and hardened, and this is an abnormal tonicity which is regarded in the same light as contractures, although that term is not applied to it. You will recognize by touch the normal feeling of the abdomen, and hence will be able to recognize any departure from the normal. Kirk is authority for the following statement: "Though involuntary muscle cannot be thrown into tetanus, it has the property of entering into a condition of sustained contraction, called tonus," which is, as far as our purpose goes, practically the same thing. You will find in your work that there is quite a difference between the feeling that you get from contracted muscles in the back and the feeling that you get when working upon the abdomen. Now, the external muscles of the abdominal wall may be contracted as well as those internal muscles, and you will find often the outer covering of the abdomen much contracted and hardened. As I said, you will have to learn by experience what is the natural feeling of the muscles in the back and muscles in the abdomen, and how they have departed from that by becoming contracted. Then, again, the question comes, "Is it not exercise that makes these muscles hard, particularly in the back? Therefore, how can the Osteopath recognize the difference between the normal hardening of a muscle due to exercise, and a contraction of the muscle which is called a contracture?" There are various ways, some of which I shall give you later in the lecture, but one way is that when a muscle is hardened by proper exercise it is homogeneously hardened, the same degree of hardness all over it; while when you come to feel of a muscle which is contracted, you find it raised in welts. We shall find the reason for that presently. Of course, there is contracture which, according to the definition, would be called contracture, but different from what I have been describing. That is in set limbs in rheumatism, and things of that kind, but you will recognize those readily by the case itself.

Now, we usually find these contracted muscles not only in the back and abdomen, but we find them frequently in the neck, and that is one important place that you will have to watch for hardening of muscles. The explanation of the contracted muscle rising in welts on the back; when you work upon the back you will find that parts of muscle slip under your fingers, as if you were working over a whip cord or something hard; that is what is called a welt. You will, of course, find muscles normally contracted to produce motion. I take the following quotation from Gowers, which will explain itself: "Every movement is due to a contraction of a series of fibres, which seldom corresponds to the series massed together in a muscle." That is, you frequently have a contraction of different fibres,

you might say a sort of a wave of contraction running through different fibres of different muscles to produce complex movement, and he says that it is seldom that these movements are massed together in a muscle. Of course, there are prominent exceptions to the rule, one being that of the biceps. He goes on to say, "Fibres, not muscles, are represented in the structure of the brain, and those that cause a simple movement may be in several muscles." Hence, a derangement of a certain part of the motor area in the cerebrum may cause a lesion of parts of several muscles, or a lesion of different motor nerve fibres may cause a contraction of parts of different muscles. Howell's Text Book states, "If the muscle be in an abnormal state the contraction may remain localized as a swelling or welt." That is the term by which we usually describe those contractions.

The Osteopath is sure of his grounds scientifically when he says to a patient that the muscle has contracted and has failed to relax. When he finds that such a condition is present, it is a basis of work on his part, to be treated as a lesion, and when he describes it as a welt, he is in accord with the authorities.

The question naturally comes; "What is the CAUSE OF THESE CONTRACTURES?" The Osteopath regards them as peculiarly significant from his standpoint. We noted, in quoting from Howell's Text Book, that he said constant irritation produced constant contraction, so it must be some irritation which is continually acting upon the muscle itself or upon its nerve connection, causing it to act in this way. That would lead you to inquire if the irritation came through the sympathetics. You will find some of the visceral diseases sending continuous impulses over the sympathetics, through the spinal nerves to the muscles of the back. Dr. Allen, in the article quoted from the Journal, states; "Contracture of muscle, is due to disease of the muscles, to primary disease of the nervous system, to loss of antagonism, as well as to excessive use of one set of muscles over another." Gowers, in speaking of nerves and muscles, says; "The excitability is changed by disease, of which the change is often an important symptom. It indicates the state of nutrition of the nerve-fibres and muscles, and from this we can draw important inferences regarding the condition of the centers." Gowers states that paralysis or abnormal excitability of a nerve refers to the nerve center controlling it. If the abnormal excitability has been such as to result in contraction, it will refer us to the point from which the irritation came; it may be the distant center or distant periphery of some other set of nerves, reflected sympathetically.

In discussing before you previously the Osteopathic view of contracted muscles, I said that the Osteopath regarded them in one case as primary and in another case as secondary. Primary is where a muscle is directly acted upon by some external force, some blow, strain, or draught of cold air, causing it to contract. The contraction then is your primary lesion.

It will impinge upon the nerve fibres, as we saw a few days ago in quotations from one of the authorities, that the terminal sensory fibres of the muscles are irritated by contractures, and that constant irritation may be set up and carried into the system anywhere, according to the centers affected. This, then, would be a primary lesion. A secondary lesion would be one of the kind described a few minutes since, when I noted the fact that we might have stomach trouble producing secondarily a lesion of the muscle of the back producing welts, so-called contractures. When the lesion is primary, it indicates at once to us where the trouble is, and you, as Osteopaths, have learned by this time that you must go to the seat of the trouble; even though you have to trace it a long way back, you will finally come to it. So that when you have the contracture acting as a primary cause of disease from its nervous connections, then of course by removing the contracture, you have removed that which is irritating or inhibiting. You have restored the normal, and allowed Nature to take care of the balance. When it is secondary, it is a symptom, as Gowers says, of a diseased condition of a center; it may be, and so the Osteopath treats it. In case the diseased stomach has caused a contracture in the back, we could not say that by removing that lesion that we have removed the primary cause. But the value of that to the Osteopath is that he thereby sees where the trouble is; it is to him a symptom, and he can trace it back, and aided by other symptoms, find the original cause. Not only that, but, according to what we have learned previously, the effect that the Osteopath can have by working through nerve terminals may be gotten. He can work upon these lesions, which are secondary, and remove them, and thus affect the peripheral terminations. Now, if the cause works backward over these nerves, his work can reach forward along the same track, and he can get an effect upon the original seat of the disease. He can stimulate the stomach, in other words, by working along the back in the region of the splanchnics. Of course he would combine work upon the secondary lesion with work upon the original cause of the disease, whatever it was, and his good judgment and ability to diagnose would have to tell him when the lesion was primary or secondary. I recollect a case of Chorea which had been of seven years' standing. It was the case of a young lady who was some twenty years of age, and was very bad when brought to us. She tossed about and nearly threw herself from the table, and it required one to hold while another treated. The lesion in that case we found along the back on the left side of the spine; the muscles were in a contracted condition all along that side of the spine. We also found that the muscles in the neck were quite stiff. We were particular to remove that congested condition of the muscles, and the cure was complete, although the case had been of so long standing. It was a satisfactory case. Now, the question is, whether that was a primary lesion or a secondary,

and it is very hard to say. The causes of Chorea are external sometimes; rheumatism or exposure, and in such a case the lesion may have been primary, the effect of exposure or rheumatism may have hardened the muscles in the back. In other cases it is due to over-work, worry and a whole list of different causes. So it may have acted indirectly, and thus have produced these contractures through the nervous system. By working there we remove that lesion, whether it was primary or secondary, and we get our results. We used general treatment with the special treatment which we gave to the lesions. My chief purpose in following this line of thought was to show that the Osteopath in talking about contractures, in treating them as lesions, and in working directly upon them as such, is thoroughly scientific. As I showed you in previous lectures, he can work upon nerve terminals in these muscles and thus gain important results. And I think that an Osteopath in an argument with a physician ought not to come out second best.

There is one further point which I want to bring out; that is the fact that you will find FLABBY MUSCLES, and when a muscle has become flabby it is usually an indication that the disease has progressed to a considerable degree. Very frequently these muscles have lost their tone, and our mode of reasoning is that we must restore life to them. I wish to state what Gowers has said in this regard. He says that when a muscle is thus flabby, it shows some lesion of the nerve-fibers controlling the muscle. Pathology has shown that section of a motor nerve of a muscle will lead to deterioration in the condition of the muscle. Hence, there is close trophic connection between the nerves and the muscle fibers, so that, reasoning from that, when you find a flabby condition of a muscle, you must have a diseased condition which has advanced considerably.

In previous lectures I have considered fully the spine. First, how to examine it; second, how to consider the lesions found, that is, their significance; and third, how to treat your lesions when found. I know of no other points which I should bring up in that connection. I shall, therefore, go to the neck, and tell you of its indications.

II. LANDMARKS CONCERNING THE NECK.—First, as Holden says, we note a great difference between the *skin on the back of the neck*, where it is very thick, and that on the front of the neck, which is extremely thin; this is the best place in the body to note that difference. The *external jugular vein* corresponds with a line drawn from the angle of the inferior maxillary bone to a point at the middle of the clavical. We find in certain heart troubles a venous pulse can be detected in that vein, we can see it from a distance. There is a case in town in which the venous pulse can be seen in the jugular vein. There is also a venous hum in that vein in anemia.

The *hyoid bone* is on a level with the lower jaw; the gap just below it corresponds to the apex of the epiglottis; therefore any deep cut at that point leaves almost the whole of the glottis above the cut. The *thyroid cartilage* is familiar to you all, and you can by feeling carefully trace out both the upper and lower cornua. The lateral lobes of the *thyroid gland* lie on each side of the thyroid cartilage; the *bridge* lies across the middle, and in that region you can feel the pulsation of the *superior thyroid artery*. The *crico-thyroid membrane*, as you know, joins the thyroid and cricoid cartilages, and that is the point at which laryngotomy is performed. The level of the cricoid cartilage corresponds to the interval between the *fifth and sixth cervical vertebrae*; it is also the level of the *oesophagus*. Hence, if a child has attempted to swallow something too large for it, it will probably be lodged in that place. The superior opening of the oesophagus is usually an inch and a half above the sternum, but it may get as far as two and a fourth inches above the sternum. Normally about seven or eight rings of the trachea protrude above the sternum, but they are not felt from the outside, being covered by other structures. Surgical operations are conducted in the middle line of the neck, which is called the "line of safety."

III. HOW TO EXAMINE THE NECK:—You all know that there is nothing of greater importance to the Osteopath in the body than the neck. Dr. Harry Still is authority for the statement that almost all diseases of the body can be treated through the neck. This is putting it very broadly, but it is very expressive. You can treat in the neck alone and affect the stomach, heart, liver or intestines and you can treat in the neck and affect the brain, or the vaso-motor life for the whole body.

In the examination of the neck I have divided the subject into first, the THROAT. You all know where to find the *tonsil*, just beneath the angle of the inferior maxillary bone. It is very readily felt when you want to find it. In case of tonsillitis it is easily found. If you cannot find it on the outside, you can examine inside the throat. So in examination of the throat you must always look for the tonsils if you suspicion tonsillitis. You must look for *tender points* about the throat, and where we frequently find them is, in case of catarrh, just below the angle of the jaw. Further, in examination of the throat, always look to see what is the condition of the *hyoid muscles*. They are of great importance to the Osteopath—those above the hyoid bone and those below it; either or both may be contracted, congested, or drawn, shutting off the blood supply to the other parts of the head or the throat, causing numerous troubles. You must always examine your patient to see that all parts are normal. You should direct your attention first to the hyoid bone, then to the thyroid and cricoid cartilages, not because we find them of great Osteopathic significance, but to see that

everything is normal. In order to recognize the abnormal you must acquaint yourselves with the normal. The thyroid gland itself has been described. You should bear in mind that it may be enlarged in disease, as in goitre, or it may be atrophied, as in myxedema. You will be able to find it very readily, and you must decide whether it is enlarged or wasted, and therefore, you must know what is its normal size.

You will frequently find that the *lymphatics* are enlarged in the neck; the kernels or glands are found along the course of the veins in the neck; The *lymphatic glands* sometimes become enlarged, and remain so for years, showing that there is some irritation or some septic process still going on. In people with chronic sore throats we will frequently find that the lymphatic glands are enlarged, sometimes they are left so by diphtheria, or any disease which leaves in the system a septic product, which is taken up by the lymphatics. So you must look to see whether or not the lymphatics are enlarged. If they are, the treatment is not to them, but is to remove the cause of the disease.

A further point as to the anatomy of the neck in connection with Osteopathy; you will find that the *glossopharyngeal*, *pneumogastric* and *spinal accessory nerves* leave the skull through the jugular foramen. The pneumogastric runs on down just behind the anterior border of the sterno-mastoid muscle, and we work upon it as we work along the muscles. Frequently we work upon it high up at its exit from the skull, that is, as near as we can get to it. We can usually bring deep pressure upon the nerves at that point. Frequently, also, we work upon these nerves through their sympathetic connection with the superior cervical ganglion.

The *phrenic nerve*, as you know, springs from the 3d, 4th and 5th cervical nerves, and you reach it at the anterior border of the scaleni muscles, along in front of the transverse processes of the vertebræ. You can impinge upon the nerve by pressure between the sternal and clavicular origins of the sterno-mastoid muscle. That is where the treatment is usually given in case of hiccoughs.

LECTURE XIII.

At the last lecture, under the general head of theory of work upon centers, I considered contractures, their occurrence, nature and cause. I explained, according to the authorities, how these contractures happened, and that this was the scientific definition, the term meaning continued contraction. I quoted from Gowers, Howell's Text Book, and others, to substantiate the point. I called to your mind the clinical importance that is attached to these conditions, especially by the Osteopath. I called to

your mind their nature, that is, that they are called a tonic spasm, being considered in the nature of a tetanus; also the fact that the continued tonicity of the involuntary muscles might exist, which for our purpose is practically a contracture, although not called so. I called your attention to how you might recognize the difference between these conditions by the touch. The chief points where these occur are in the neck, back and abdomen, as well as the limbs in some cases. I called to your attention the fact that muscles normally contract not as a whole usually, but as separate fibres of several muscles, according to Gowers' authority, and that accounts for the appearance of welts, the feeling of welts under the fingers. That the cause was some constant irritation, some direct injury to the muscle, or some exposure or something of that kind. The contracture might be primary, as in the case of a blow or injury; and secondary when a muscle contracts due to a trouble which is far removed, as for instance muscles over the splanchnics contracted secondarily to the affection in the stomach. I noted that muscles which felt flabby were a sign that the disease had probably progressed for some time, and that the centers and nerves were affected. I also called your attention to certain landmarks in the neck. To-day I wish to consider the same general subject further.

I. THEORY OF OSTEOPATHIC WORK UPON THE NERVE CENTERS.—(*Continued.*)—(Under the Special Head of Further Possible Lesions.)—I have explained to you the nature of some lesions; at the last meeting the nature of a lesion when it is a contracture. I have also called to your mind other lesions, such as a slip of the vertebræ, a displacement of a part, bringing pressure upon a blood vessel or upon a nerve. I believe I mentioned tumors at one lecture, but I shall carry that idea further at some time. Also I mentioned the lack of normal blood supply, being anemia, or perhaps too much blood, being hyperemia. So that we have already considered certain lesions which may affect the body, may act through the nerves and cause disease.

A further very important lesion which we frequently find in our work is a THICKENING OF LIGAMENTS following a strain or some injury. Pathology teaches us that after having irritation we frequently have an inflammation. That means that too much blood is circulated about the part, and in the natural process of inflammation an exudation follows, first fluid, later cellular, of both red and white corpuscles. When this state of inflammation has gone far enough you have resulting a new growth. We know that this new growth is *connective tissue or scar tissue*. It will be seen in a disease called Cirrhosis of the liver, usually induced, or sometimes at least, by the drinking of alcohol. The alcoholic poisoning sets up an inflammation. Following this inflammation there results a growth of new connective tissue, the connective tissues normally occurring throughout the liver are thickened. Now, this new growth of connec-

tive tissue does little harm as long as it is new and fresh and filled with blood vessels. But sooner or later the blood vessels begin to be contracted and absorbed, the tissue loses its blood supply, and then it begins to contract and become pale. When that process has gone far enough, the contraction has acted mechanically and shut down upon the blood supply passing through the liver; thus the portal circulation is obstructed, and the blood sets back and produces what is known as Ascites, or Dropsy of the Abdomen. There you have a thickening of the connective tissues, you have resulting from that a condition of pressure, a shutting down of the thickened tissues upon the parts concerned. In Sclerosis of the spinal cord you have a thickening of the connective tissue either at the expense of, or following degeneration of, the nervous elements of the cord. When you have had a wound, say a cut with a knife, you have, in the process of healing, the formation of what is known as *granulation tissues*, this is followed later by the appearance of blood vessels in new connective tissue, and you have your scar. So-called scar tissues occur not only after cuts and wounds, but after abscesses and various pathological processes in the body. I wish to bring these things to your attention for the purpose of showing you that it is a constant and very general pathological tendency in the body to produce new connective tissue, and it is the tendency of that connective tissue when produced to contract. There you have something that is a very frequent source of disease, and it is of especial interest to the Osteopath, from his point of view, since it means that there may thereby be a mechanical lesion, a direct shutting down upon the parts. You have all known of cases where a scab has formed upon some external sores, catching some sensory nerve terminals in its connective tissue, as it becomes old and commences to contract, it irritates those termination of nerves, producing constant pain in the part.

I wish to quote from Green's Pathology, where he says; "The new connective tissue is called inflammatory or scar tissue. The tendency to contract is characteristic of this new fibrous tissue. This contraction of scar tissue may produce serious results." You will readily recognize the Osteopathic significance of anything that will contract or obstruct the channels of blood or nerve force. These causes are especially significant, it seems to me, in relation to the spine, so I have considered that first. Now, what may the nature of your lesion be? As I have said before, it might be a VERTEBRA DISPLACED; it may be twisted or slipped, or in any way so placed as to bring irritation upon the parts surrounding it. It makes no practical difference for our purpose whether first that irritation acts upon nerves or upon blood vessels, just so it be sufficient to act upon the ligamentous parts about the vertebræ to irritate them. You will then have an inflammation. Secondary to this irritation you may not have inflam-

mation, but hyperemia. Following this inflammation you would naturally, according to the laws of disease, have a thickening of the connective tissue. I wish again to quote from Green, speaking about inflammations, and under the head of "injuries, slight but long continued," he says, "In many cases the inflammatory process ends in the formation of new tissue—inflammatory fibrous tissue." You will notice there that the injury may only be slight, but long continued. Such is the nature of a great many lesions that we find in the spine. A man comes to the Osteopath's office for examination. He says, "You have had a strain or twist here in the spine in some way." The patient says he never had any strain there. The Osteopath still thinks that he must have had a strain there. The reason why he did not know it was simply because it was so slight as to escape observation, and has not been attended to because slight, and therefore has been long continued, and finally results in some process of pathological growth. Further, Green says, "If the hyperemia be of long duration or frequently repeated, the epithelium and connective tissue of the part increase." So an inflammation is not always necessary to produce thickening of the connective tissue, but it may occur from hyperemia. Too much blood about a part may, according to Green, cause a thickening either of the epithelium or of the connective tissue. So your lesion which has produced nerve irritation and caused inflammation, may be slight, or on the other hand, may cause hyperemia, which may not necessarily be known to the patient. So much, then, for the tendency of these newly formed tissues to contract and to obstruct. From what I have said you will see the significance of these things from our standpoint, as I have explained to you the effect of thickening of tendons or hardening of muscles or ligaments.

The lesion may be not only in the nature of some slip or twist of the vertebræ, but, secondly, it may be a strain, a pull, a cold draft, or something of that nature—EXTERNAL VIOLENCE. You are all familiar with the phenomena which follow a sprained ankle, as we call it, and you have probably often heard the physician say that such an injury was in some cases worse than a broken bone. You have, following a strain, an inflammatory process, and following that inflammatory process, this thickening of the connective tissue. Then, again, you may have a lesion in the nature of BAD BLOOD. If the blood is not pure, and if all of the excretory organs of the body are not doing their duty, the bad blood then acts as an irritant and may inflame parts. Your lesion may, fourthly, be in the nature of some EXPOSURE, or cold, or rheumatism. Quain, in his dictionary, speaking of disease of the spine, says, "The ligaments here, as in other parts of the body, are especially liable to a rheumatic form of inflammation." Inflammation means to us the formation of a new growth; a new growth very probably means the formation of an obstruction, which acts as a

continual irritation upon the part affected, with all the concomitant results. In view of the above facts, may not any Osteopath see the tremendous significance from his standpoint of slight, or it may be severe, sprains, slips, twists, subluxations, injuries, exposures, and the like? Can he fail to recognize the importance of such factors in the causation of disease, or can he disregard the therapeutic value of their removal? It seems that when we look at these things from an Osteopathic standpoint, they become fraught with great significance, and to my mind, nothing is more encouraging to an Osteopath than the thought that he can go about to remedy these pathological results. I have brought this up because it seemed to me that these were Osteopathic points. Hence, you will note the importance of what we have said in previous lectures, that you should always and under all circumstances look for lesions. You should always, also, inquire into the history of the case.

The method of questioning is one of the valuable means by which we diagnose the case, it is the only thing that leads us into the history of the case.

These lesions, such as described, are of particular importance to the Osteopath because a contraction may cause, for instance, DISTORTION OF A PART, as we frequently find in our practice. When a part has left its normal position it may very likely be obstructing some of the fluids of life, or pressing upon important parts, producing disease. So that the result of the lesions may not only be distortions but may be obstructions of parts; further, they may lead to ANKYLOSIS OR OSSIFICATION of the parts. Quain's Dictionary, in speaking of Pott's disease, says, "In the majority of cases ulceration of one or more intervertebral cartilages occurs as a result of sub-acute inflammation; if the case proceed favorably toward a curative termination, the destructive process becomes arrested, and a healthy process is re-established, terminating in bony ankylosis between the bodies of the vertebræ; ossification also spreads along some of the ligamentous structures passing between the laminæ, as well as between the spinous processes." "Thus," he goes on to say, "the resulting posterior protrusion becomes a persistent deformity, a deformity essential to the cure of the disease." Pott's disease, I might say, is the extreme posterior curvature of the spine, also commonly called hunch-back. Now, as to this explanation, there are several points to which I wish to invite your attention. In the first place, it emphasizes the importance of inflammation, as he says the condition may result from inflammation between the bodies of the vertebræ. Further, that the inflammation may be the result of some rheumatic process started in the ligaments about the spine. Second, that the result may be ankylosis or ossification, if the case has gone far enough. Third, to the Osteopath it is difficult to call a deformity a cure; that is what we call disease; patients come to us with

deformities to be cured. It has been a matter of some surprise that I noticed that not only Quain, but others, for instance, Hilton, speak of cure by fixation or ossification of parts. Now, I do not call this to your attention to tell you that you can cure ankylosis of the vertebræ. However, there is a kind of ankylosis that may be cured by the Osteopath and that is the ligamentous form. When it has reached ossification it is beyond our power. What the Osteopath is called upon to do in such a case, where there is fixation of parts of bony growth, is to give relief or perhaps strengthen the general condition of the body, which he can very frequently do. The peculiar work of the Osteopath, in cases which are proceeding to such a termination, is not that he may remove the ankylosis or the ossification, but that he may prevent its forming. Our practice justifies the statement that he can prevent such things. A great many cases of spinal curvature have been cured outright, and there is no telling what the termination of such a case of spinal curvature might have been. It might have gone on to ossification or ankylosis of the joints. The facts are that cases of deformity have been saved from being permanent, and that people have been saved from the lives of cripples time and again by Osteopathic therapeutics. And so these things are significant to us more in a prophylactic light, that is, that we may prevent their growth.

For examples of the general cause of disease following a slip or strain which have resulted in a thickening of ligaments, I wish to note several cases: I have had cases in which, along the region of the splanchnic nerves, there was a tightening of all the ligaments, the parts of the spine being approximated. The result of that lesion was some form of stomach trouble. I have seen a case of neurasthenia, which I would attribute to such a cause. When practicing in Chicago, we had a gentleman who was in rather a remarkable condition. His general trouble might be described as neurasthenia. His trouble was largely circulatory and nervous. He had a skin as soft as a baby's almost; a ruddy complexion; looked strong and healthy, and one would hardly think there was anything wrong with him. But he said he would at almost any time break out into a perspiration, when there was not any heat at all or exertion to account for it, or perhaps he would be chilly. Then, again, he would flush up following any exertion. He would have trouble with his head, and could not work at times. Again he would be bothered with sleeplessness. Now, those were general nervous troubles and troubles of the circulation. He was a man, who on account of his disease, led practically an outdoor life. The lesion in his case was along the spine. We found that the ligaments along the spine were tightened, and that the muscles were contracted.)

Now, whether or not the theory fits the facts, and whether or not all these things are brought out properly, they explain, at least theoretically,

what we do when we meet similar cases and go to work to remove such lesions. Such lesions then, may come, first, by direct impingement and irritation of the nerves. As, for instance, where they emerge from the spine at the intervertebral foramina. Second, they may act through the blood supply, as was shown in a lecture or two since, by causing anemia or hyperemia of the centers or the nerves. This hyperemia or anemia may be collateral on account of the condition of the circulation to the spinal muscles, or the anemia may exist directly by pressure at the intervertebral foramina on the anterior and posterior spinal nerve branches, or perhaps by pressure in the same way on the vertebral branches of the arteries, and thus shutting off the blood-supply to the cord.

II. LANDMARKS CONCERNING THE NECK:—(*Continued.*)—

Holden notes the sterno-mastoid muscles, which he calls the surgical land-mark of the neck, and calls to our attention the fact that it stands out in relief when acting to turn the head toward the opposite shoulder. Behind its inner border lies the pneumogastric nerve, in the same sheath with the common carotid artery and the internal jugular vein. The common carotid artery runs as far as the upper level of the thyroid cartilage, where it branches into the internal and external carotids; its course corresponds to a line drawn from the sterno-clavicular articulation to a point midway between the angle of the lower jaw and the mastoid process. Note the interval between the sternal and clavicular origins of the sterno-mastoid muscle. Just behind this interval lies the common carotid artery internally, the external jugular vein externally. Between them, and a little posteriorly, lies the pneumogastric nerve. The sterno-clavicular joint is important. Behind it lies the commencement of the vena innominata. It is the level of the division of the innominate artery on the right, and the level of the apex of the lung. As to the apex of the lung, it may rise one and a half inches and perhaps two inches above the sterno-clavicular joint. This is the part of the lung which is least apt to be inflated with air, and hence very apt to be the seat of disease. I have already called your attention to its examination by percussion at the sternal end of the clavicle. The subclavian artery is also important. In the supra-clavicular fossa, just at the outer edge of the sterno-mastoid muscle, about an inch above the clavicle you will feel the pulsation of the subclavian artery; at that point it crosses the first rib. Pressure slightly downward and inward there will impinge upon the subclavian artery, a little pressure is sufficient. As you know, the outer border of the sterno-mastoid muscle corresponds nearly to the anterior border of the scalenus anticus muscle, and that across the scalenus anticus runs the phrenic nerve. Now, at about the point where you impinge upon the subclavian artery you will also reach the phrenic nerve. In fact, the way Dr. Harry Still often treats

hiccoughs is by standing behind the patient and placing his thumb along the outer edge of the sterno-mastoid muscle, thus reaching the phrenic nerve. Deep pressure at the upper (outer) part of the supra-clavicular fossa will reach the transverse process of the seventh cervical vertebra. In a long thin neck it is stated that just above and nearly parallel with the clavicle can be felt the posterior belly of the omo-hyoid muscle, as it rises and falls in inspiration.

III. I wish to continue the EXAMINATION OF THE NECK.—(*Continued.*)—There were a couple of points that I should have noted in going over the spine, but they slipped my mind at the time. One of them is how to stretch the quadratus lumborum muscle. This muscle in various cases will become contracted and will then draw down the lower rib, and may make considerable trouble. I have found that I could treat a lame back in that way and get results that I could get in no other. Frequently the lameness is between the fifth lumbar and the sacrum, because the traction in the quadratus lumborum muscle is drawing the pelvis up and is bringing a strain at the point of junction of the fifth lumbar with the sacrum. I have often removed lameness there by stretching that muscle. It takes a diagonal pull to stretch the quadratus lumborum properly. If I have an assistant I have him draw on the pelvis while I draw the arm obliquely in the other direction. I draw steadily, but do not jerk, and put a considerable force of traction upon the part. Then I have my assistant take the arm, and I stretch in the other direction, and in that way I get traction upon every part of the quadratus lumborum muscle.

The other point concerning the spine was, that you will in passing your hand over the back, frequently detect CHANGES IN TEMPERATURE. You will find a warmer spot, or, more frequently a cold streak following the distribution of the inter-costal nerves. That is quite an important method of diagnosis. You should accustom your hand to detect differences in temperature. That has to be done next to the skin. When you find that it indicates at once that the blood-supply is not equally distributed, and that probably there is a lesion along the spine at the point where the cold streak leaves it. If you find it hot it may mean the same, but we do not find that as often as we do the cold streak.

In the consideration of the neck I have divided it into, FIRST, THE THROAT, which I considered at the last lecture; SECOND, THE NECK PROPER; which I shall consider at this time. I have already noted the spines and and the *peculiar vertebrae*, and the fact that you can note the dislocated vertebra sometimes by an examination in the pharynx by means of the finger. I have called the *atlas* to your attention, and the fact that you must *turn the head from side to side* in attempting to examine the articular process of the vertebræ. In a case of *fracture*, which we may possi-

bly find, there will be crepitus and abnormal mobility of the parts. You should in your examination of the neck look at the condition of the *superficial and deep muscles*. Carefully examine to note any hardening of the muscles. The hardening may be in the superficial muscles or in the deep muscles; you will have to judge as to where the tightening of the muscle is. Examine very carefully all about the superficial and deep muscles. It is usually in the throat that you find the superficial muscles contracted, and the deeper ones, in the neck further back. The *sterno-mastoid muscle* of course always comes prominently to your attention. It is contracted in cases of torticollis; or it may be hardened and produce pressure upon the structures beneath it. Then examine the *scaleni muscles*. You know how they are attached, reaching all the way from the second cervical down to the seventh, then to the two upper ribs. Normally these muscles will feel rather hard, you will become acquainted with the normal feeling of them. They are significant to us from the fact that they sometimes become contracted and bring traction upon the upper two ribs. Hence it is that any displacement of these upper two ribs is very likely to be upwards. This will cause heart trouble, or lung trouble, etc. These muscles are useful in replacing ribs which are dislocated. I have already noted the *ligamentum nuchæ*; how you may find it and how you may treat it. The neck is about as good a place as there is for the Osteopath to find *sore spots*. Principally you are liable to find them in the fossæ just below the occipital bone. In the normal neck there is no soreness there. Of course you may impinge at any time upon a nerve hard enough to hurt it. Why these sore spots occur is hard to say, but I think the soreness is due primarily to the condition of the great and sub-occipital nerves which you find at that point. I do not think that it is just because you touch them, but they were sore before you touched them. Then you will often find that just below the occipital protuberance there is a sore spot; and just there you will often find a tightening of the ligaments. The lesion is important because if you find a sore spot there or in the fossa below the occipital bone you are led to believe that there is some irritation affecting the sub and great occipital nerves, and since they are in close connection with the superior cervical ganglion of the sympathetic, they may have an effect through it upon the distant parts of the body. You should also examine in the *region of the three ganglia* of the sympathetic. The superior cervical ganglion is opposite the second and third vertebræ on the rectus capitis anticus major muscle. The second cervical ganglion lies opposite the sixth and seventh cervical vertebræ, while the inferior cervical ganglion lies just below the seventh cervical vertebra, and is frequently coalesced with the first thoracic ganglion of the sympathetic. Quain puts it, that this inferior cervical ganglion of the sympathetic lies just over the costo-central articulation, that is, the ar-

ticulation of the first rib with the spine. Now, if you should find lesions in those places they are significant to you according as they may affect the sympathetic life of the individual. They may affect the brain, heart and lungs, or any distant part of the body. Also remember the spinal nerves here, those of the cervical and brachial plexuses. Impinge upon these nerves where they pass out between the scalenus anticus and scalenus medius muscles, and, upon deep pressure the patient will tell you he can feel pain in his shoulder and arm. You should also here look at the *temperature* of the parts you are examining, and I think that nowhere else in the body we as frequently find a cold place as in the back of the neck. I thought that perhaps it was because it was more exposed, but I doubt that very much because I have treated patients who had been in the house for hours, and those muscles were cold. I have treated patients in the heated period of summer, when certainly there was not any chance of there being exposure to cold, and the temperature was abnormally low. That argues to your mind certainly that there is some inequality in the distribution of the blood-flow, it may be a tightening of the muscles upon the blood vessels, but it shows you, at any rate, that there is the seat of the lesion. In this examination you must look at the condition of the *blood-supply to the throat* through the neck and thus to the brain, which is important, and you should be very sure that the blood-supply to the neck and brain are normal.

Q. You spoke of treating the phrenic nerve above the clavicle. Could it not also be reached from the second to the fifth cervical?

A. Yes, sir; Dr. Harry Still frequently works along the third, fourth and fifth cervical. The phrenic nerve arises from the fourth, also partly from the third, and has a connecting branch from the fifth. So we work at the anterior edge of the scalenus medius and impinge upon the nerve by pressing backward against the transverse processes of the vertebrae.

LECTURE XIV.

At the last lecture, I considered briefly possible lesions of centers. I shall carry that idea further to-day. What I took the most time to explain was how thickening the connective tissue of parts might lead to impingement upon blood vessels or upon nerves, showing that, in the first place, there might be an irritation caused by a slip of a vertebra, thus setting up inflammation, this followed by formation of new tissue which has a tendency to contract. I showed that the same thing could follow hyperemia. Such things, then, are significant to the Osteopath, since they act as obstructions to the flow of blood and nerve force.

Such lesions may, if not prevented, go much further, resulting in bony ankylosis of joints or in ossification of ligaments, setting up a permanent deformity. It is the function of the Osteopath not so much to treat that deformity, as to prevent it. That is, in such case his treatment is prophylactic.

I then called your attention to landmarks in the neck, and to certain points in how to examine the neck.

I. THEORY OF WORK UPON CENTERS.—(*Continued.*)—Further possible lesions. You may have a pressure upon important parts by EXUDATES OR BY OEDEMA. An exudate is in nature fluid or cellular, and it follows pathological processes in the nature of inflammations or hyperemia. Having an inflammation, you have an exudation of the contents of the blood vessels, those contents are fluid, or in the later stages of the exudation, cellular. They thus may, at any place, and do, build up a considerable thickening among the tissues, acting as a mechanical pressure or irritant upon important parts. These important parts may be blood vessels or nerves. Byron Robinson says, "The nerves may suffer from pressure by exudates or oedema, congestion or from malnutrition. The final outcome is derangement of the nerves, exaltation of sensation and motion, or debasement of sensation and motion." He was speaking there particularly of the nerves to the bowels. The Osteopath's duty in relation to such things is that he must, in making his diagnosis, take into consideration the probability of there being such a lesion present. You will in your further studies, which will include pathology and other important things, learn how to recognize these lesions better than I can tell you here. What I propose to do is to use these things to illustrate the subject of Osteopathy; I cannot go into detail and explain everything in pathology that I meet, but they are valuable to you, and you will recognize their importance when you come to that place in your course. In general, you will recognize or look for the process of oedema in patients with lung, kidney or heart trouble; you will be very apt to find it in such cases; or in cases where there is obstruction to the blood-flow. It may be mechanical shutting down upon an artery, or it may be a narrowing of the lumen of a vessel from some disease, or something of that kind. The Osteopath must judge what may be the cause and work to remove the lesion. As to hyperemia, and its effects upon the cord, I have already shown this to you in a quotation from Green, where he said it caused paræsthesia of sight or hearing, or perhaps even spasms." But according to Robinson, this hyperemia may act mechanically to affect not centers only, but directly to affect nerves through pressure. Your lesion may be malnutrition, but I will notice that later. Other lesions which may produce pressure upon important parts are DEPOSITS OR GROWTHS. I wish to quote from Dr. Jacob-

son, Dr. Hilton's editor, where he says, "Sensations of sharp pains like knives around the trunk, increased by movement, and a numbed feeling about the body, may be produced by gummatous meningitis making pressure upon the posterior roots of some of the spinal nerves." You note here that the pathological process is an inflammation, that secondarily there is set up a pressure as the result of that inflammation, which is a gummatous deposit, thus it acts as a lesion producing pressure. Hilton instances a case, further, where there was pressure upon the ulnar nerve, causing much numbness, lack of sensation, and particularly of motion, in the third and fourth fingers. They became discolored, and finally gangrenous. Upon examination there was found an exostosis, an outgrowth from the bone, upon the first rib, pressing upon the ulnar nerve and the subclavian artery, thus shutting off the nerve and blood-supply partly, the nerve more fully. However, shutting off the nerve-supply, alone, would have been sufficient to cause degenerative changes in the part affected.

I wish to call your attention to this STRUCTURAL DEGENERATION BY PRESSURE upon a nerve. You may have pressure in the form of a foreign growth or in the form of some excrescence upon important parts. Further, your lesion might be an *aneurism*, and might bring pressure upon parts. Green states that, "active congestion follows pressure upon the sympathetic, as for instance in the neck by an aneurism." It may inhibit vaso-tonic action of the sympathetic and cause hyperemia, or the reverse.

Another kind of lesion which will frequently come to your attention is *tumor*, which you will notice also is of such a nature that it produces pressure upon important parts. You might take, for instance, the case of exophthalmic goitre; there you have protrusion of the eye ball due to a deposition of fat behind it. That shows an over stimulation of the trophic fibers to that part of the head. There are also cardiac symptoms, palpitation and irregularity in the beat of the heart, which show an interference with the cardiac nerves, the sympathetics receiving pressure from the goitre in the neck. And further, you have vaso-motor symptoms from the pressure of this goitre, because you frequently have a flushing of the cutaneous circulation. This is a good example of what mechanical pressure may do to influence nerve life. Robinson also instances the case of an abdominal tumor leading to fatty degeneration of the heart. The impulse is sent from the tumor along the abdominal sympathetics to the solar plexus, here it is reorganized, perhaps sent to the cervical sympathetics, down the cardiac branches to the heart, resulting in irritation and irregularity of the heart, causing the heart to overfeed itself, which finally results in hypertrophy, followed by fatty degeneration. Thus you can learn to trace the causes. Almost any

young Osteopath would treat that effect, heart trouble, when really it is the tumor, far removed from the heart, which is the cause of the trouble.

In speaking of abdominal tumors, Robinson says, "The irritation from the tumor is carried on the plexus of any contiguous viscus to the abdominal brain, where it is reorganized and emitted to the digestive tract over the gastric plexus, the superior mesenteric plexus and the inferior mesenteric plexus. In any case the brunt of the forces end in the ganglia which lie just below the mucous membrane. The ganglia constitute what is known as Meissner's plexus, which rules secretion. If the irritation be of such a nature as to produce excessive secretion, diarrhoea may result; the excessive secretions will decompose and induce malnutrition." Thus one difficulty leads to another. You might have constipation, indigestion and various troubles. He goes on to say that small tumors on pedicles, so that they may swing around, roll about, and pound upon the abdominal structures, are those which are most injurious, for obviously, if the tumor is fixed, it will not irritate much, but if it rolls about it will keep irritating the sympathetics and aggravating the trouble.

The lesions given above are the lesions which produce pressure in the body, pressure upon important structures, for the most part nerves. I have already in my lectures noted certain results that you would get from pressure upon nerves, for instance, irritation, stimulation, inhibition, hyperemia, anemia, etc. But I wish to go further to-day, and show that the result may be more serious than a mere inhibition or stimulation, that it may lead to DEGENERATION OF THE NERVE FIBERS. Thus there would be processes of deterioration of the structure of the parts, especially the nerves affected. The process of degeneration of the nerves is as follows, and is called secondary degeneration, since it is secondary to some primary lesion; it is also called Wallerian degeneration. The first process is that the myelin becomes degenerated, the sheath of Schwann becomes separated into parts, still later it becomes granulated, and finally disappears from the nerve sheath, perhaps by the process of saponification, as has been suggested by some writers. During this process, the axis-cylinder, which is the important part of the nerve, is segmented, broken down, and removed in practically the same way. Thus you finally have nothing but the nerve sheath left. The nerve has then lost its conductivity and is useless as a nerve. What I wish to show is that pressure upon nerves may be bad enough to induce this degeneration, which you can readily see is a serious result. Gowers says, "Degeneration follows many slight lesions of nerves: compression, over extension, and the like." He says further that it is probable that a compression for a few hours has such an effect in separating the molecules in the white substance of Schwann as to set up a secondary degeneration

of the same character as that resulting from division of the nerves. This pressure does not need to be severe; it may not extend over a period longer than a few hours to produce finally all the results which the Osteopath meets in his work. Pressure of some dislocated part or pressure of some such lesion as I have mentioned to-day, upon nerves, interferes with the sense of feeling and with structure of other parts, and may have an effect similar to cutting the nerve. Gowers says that after division of a nerve or degeneration of its fibers, there is a marked change in the muscles supplied by the motor nerve. This is a change which is a deterioration of their structure.

So much, then, for lesions which may be brought on by pressure. You have seen from what I have said what this pressure may result from. I wish to call your attention to the fact that the *action of muscles may, in certain cases, become traumatic*, wounding a nerve, and setting up nervous results, often degeneration. Gowers, speaking of neuritis, says, "Nerves are sometimes damaged by a violent contraction of muscles through which they pass. It is probable, also, that muscular action excites neuritis in other situations, especially in persons who are predisposed."

Also we may notice the indirect result of traumatic lesion by action of the muscles. Byron Robinson, in speaking of peritonitis, says, "Peritonitis is due to two causes, of which I will name one, viz, traumatic muscular action of the psoas magnus on the sigmoid, and traumatic muscular action of the lower right limb of the diaphragm on the descending colon." The way by which the nerves there are involved is this, That that injury allows the migration of pathogenic bacteria, which set up peritonitis, thereby crippling the nerves, and perhaps causing considerable degeneration of them. And this traumatic lesion, directly by action of muscles upon nerves, or indirectly as in the latter case, is an important thing to the Osteopath, and he must take it into consideration in diagnosing his cases. You will learn later that these nerves when degenerated, may, by appropriate treatment, of which rest and quiet is an important part, be regenerated.

To illustrate the results of pressure, take a case of which Dr. Hilton speaks, being a case of fracture of the radius. The callus, in the growing together of the bone, had pressed upon the median nerve above the wrist, and there had resulted, not a paralysis, but an ulceration upon the skin of the thumb and first and second fingers. He also notes a case in which pressure of the humerus upon the brachial plexus has resulted in a wasting of the deltoid muscle by insufficient nerve supply from the circumflex nerve, which had been impinged upon. That emphasizes the importance and necessity of taking into consideration everything which may bring pressure upon parts.

Your lesion, as I have stated, may be malnutrition. I have already explained that to some extent. Anemia may affect not only centers in such cases, but it may affect nerve fibers directly, or the malnutrition may be from a poor quality of blood.

The question comes to you, what can an Osteopath do in such cases? Can he remove exostosis, aneurisms, and such things as that? No, he can not. If you have a case of exostosis, it is a surgical case. Aneurism has usually to be treated by surgical means. I have called these things to your attention on account of their importance, and to lead you to be on your guard. You should not take secondary symptoms and treat them. Be on your guard always in making your diagnosis. Some of these lesions you may remove, such as the exudates in hyperemia or inflammation, or the gummatous tumor in meningitis, also the goitre pressing upon the sympathetic. All these things are subject to your treatment.

II. HOW TO TREAT A NECK:—I have called your attention to how to examine the neck. I wish to say to you that it is an extremely important thing that you treat the neck carefully, for the treatment of the neck, more than any other part of the body, is to be done with great care by the Osteopath. As in the consideration of the examination of the neck, I first take up the throat, so in the treatment I will notice that part of the subject first. In treating the throat your first duty is almost always to note whether there be a contraction of the hyoid muscles, and if such be the case to relax them, as that leaves a free field in which to work, since they may mask other troubles which you may not notice without having that removed first. Your TECHNIQUE OF MANIPULATION must be carefully noted, and the degree of force which you exert, because there are important structures which you may injure by rough pressure. The best way is to use the flat of the hand, the cushions of your fingers. To relax the muscles here the best way is to push the head toward the side, that is, away from you, while drawing the other hand towards you. You do not have to rub your fingers over the neck. Draw the muscles with the fingers, do not let them slip over the surface, but hold against the muscles and draw them toward you. You can do this work as thoroughly as possible without any rough rubbing; necks are readily chafed sometimes, and if you wish to save the patient to your practice you will have to be a little careful how you handle his neck.

Next as to the TONSILS. When you find an enlarged tonsil, the first thing to do is to loosen the muscles over the blood-supply to the tonsil, which is from branches from the carotid arteries. If you have relaxed all the muscles about the tonsils, both internal and external, so that there is no further impingement upon the blood-supply, then you have relieved the lesion. If the lesion is back in the vertebræ of the neck, causing

the nerves to shut down on the vaso-motor supply you must attend to that.

Generally we work directly in this way. Give it a thorough treatment, but not too hard. Work along the angles of the jaw, and then work down along the course of the common carotid artery, as far as where the artery comes from the thorax, just behind the edge of the sterno-mastoid muscles. That should be done thoroughly; you should not be in a hurry. Further, I always put my fingers behind the clavicle; be careful in putting your fingers there not to hurt, because it is a very tender point. I always put my fingers there, and then approximating the bent arm to the face, press it on above and over the head, while my fingers lie between the clavicle and the first rib. This relaxes everything; then bring the arm down over the head, outward and downward; this will stretch the parts and stimulate the flow of blood through the carotid artery. Perhaps the chief value of that movement is that we frequently find that the muscles about the upper part of the thorax are drawn and are making some impingement upon or stoppage of the blood-flow through the carotid artery, and you give it freer action by the motions you use. We also frequently stretch the jaw, as we call it. I put my fingers just below the inferior maxillary bone, placing the thumbs above, usually upon the malar processes, then holding fairly tight, spring the mouth open, rubbing downward as the mouth opens, to relax the muscles. That should be done three or four times. It is not a bad idea to hold the jaw firmly, tell the patient to open the mouth while you are holding, and that will stretch the muscles about the part.

In treating any part you must watch its blood and nerve supply. We have mentioned the blood-supply in this instance. The nerve-supply is from the pneumogastric, and from Meckel's Ganglion of the fifth. You can stimulate the pneumogastric at its exit from the skull by deep pressure. You can also effect Meckel's ganglion by having the patient open his mouth, and thrusting the fingers into the glenoid fossa, have him close it again. It will usually hurt, but it is supposed to have an effect upon Meckel's ganglion, which I will show later when I tell you how to treat the neck. The point there is the communication of the sympathetic with the pneumogastric and with the fifth and with the blood supply about the tonsils. Thus you have treated both the nerve and blood supply in treating an enlarged tonsil. If your diagnosis has shown you a tender point just below the angle of the jaw, as is stated to be the case in catarrh, the best way to attend to it is by the means already given, viz., relaxing all the parts. In that way you will throw fresh life there and take away the pain and tenderness.

*Should you find lymphatic glands enlarged it is a mistake to go at

*See appendix 6.

them and treat them directly. If they are enlarged it is from some reason. You will sometimes find them enlarged in tonsilitis or in diphtheria. They are enlarged because they have work to do as scavengers, and you must look to the original cause. I do not think it admissible ever to work directly upon those lymphatics, thinking that that will take down the enlargement, especially in acute cases. It may possibly do in chronic cases, but in acute cases I have known of injury being done by rough treatment of enlarged lymphatic glands when the trouble was somewhere else.

Q. In the case of tonsilitis, would you not stimulate the blood away from the tonsils.

A. When you have stimulated the arterial supply, you will sweep away the congestion. Whenever you have attended to the nerve-supply there, regulating the blood, the vaso-motors, of course then you get the same effect, it all tends toward the normal and to restore the circulation as it should be.

Q. Increasing the arterial flow will sweep away the congestion?

A. Yes, that is the tendency; that is how you can affect congestion through blood-supply, but do not forget to couple it with nerve-supply, vaso-motor.

Q. I thought the way to get at it was to drain the congested part by venous withdrawal.

A. That comes partly through your vaso-motor effect, but if you can get sufficient "vis a tergo" to sweep that all out, that is all you need, and that is readily done.

Q. Do you always have a local œdematous condition with inflammation?

A. I do not know that there can be an inflammation without œdema—without an exudation; that is one of the important symptoms of inflammation.

Q. Do you treat the sympathetics for goitre?

A. The cervical ganglia, all three of them, I would treat, but would especially direct my attention to loosening the anterior and posterior muscles, with the idea of relieving all parts and allowing a free flow of blood and nerve force. Of course you must do here, as you always do, look for the lesion. You may find the clavicle is slipped, or you may find that one of the vertebrae is displaced—it depends upon the cause.

LECTURE XV.

At the last lecture I considered, under the general subject of theory of work upon centers, further lesions that you might meet in your work. I noted that you might have pressure by exudates or edema; that the exudate might be fluid or cellular; that the Osteopath must take into consideration the possibility of such lesions and be on the lookout for them, thus going into the history of the case. For instance, if there is a history of inflammation, you will look for such a possible lesion, or if a history of congestion, you will look for that lesion. The lesion may be a congestion bringing pressure upon parts, or it may be malnutrition; it may be some kind of a deposit, for instance a gummatous deposit, of which I instanced a case, the pressure of the gumma upon the posterior roots of the nerves, where they emerge from the spinal column. I spoke also of an exostosis, or growth from a bone; the lesion may be an aneurism bringing pressure upon the sympathetics; or it may be some kind of a tumor, as in the case of exophthalmic goitre. I then quoted from Robinson to show what the effect of such lesions might be. I went further to show that the result might be more serious than mere stimulation or inhibition of nerve-force, showing how it might cause actual degeneration of the nerves and paralysis of the parts supplied. I showed you how such degeneration might be accomplished by the traumatic action of contraction of muscles. That although the Osteopath was not able in every case to remove these lesions, he may prevent their formation, or he may be able to recognize the presence of such lesions and send the patient to a surgeon if the case required surgical interference, without himself bothering with them.

I. GENERAL CONSIDERATIONS.—There is a question that sometimes arises in the mind of the Osteopath as to what the effect of STIMULATION OR INHIBITION will be upon parts which he is not attempting to affect, but which are connected directly or indirectly with the parts on which he is working. In other words, will he thus stimulate or inhibit other important parts of nerve-force, and thus, you might say, set up a pathological result, and his treatment result in certain pathological processes which were not intended? Every once in a while a patient will say to you, such and such a thing happened after your last treatment, and do you think that your treatment could possibly have led to such a trouble? If you are perfectly sure that the action of your treatment upon surrounding parts is not such as to produce pathological results, you will often be able to answer him strongly in the negative, when otherwise he would think you to blame for something that happened. You will frequently meet cases of that kind. I have had a number of such questions asked me. When considering probability, remember

that the tendency is always toward the normal, and that helps you much, unexpectedly as well as expectedly sometimes, not only where you remove a lesion and depend upon nature to tend toward the normal to restore things as they should be, but the manipulation that you make upon an affected part tends to restore that part to normal, while a manipulation that you make upon the parts associated does not tend to the abnormal of those associated parts at all, but the effect upon them is simply what might be compared to the effect of exercise. So you need not be afraid of producing pathological results in that way. For instance, we have to treat the pneumogastric in a case where the liver is not acting properly, and the intestines seem to be lacking in stimulating force. Part of our treatment in such a case would be directed to the pneumogastric nerve, since it has to do with these viscera. Now, the question is, whether by stimulating, or inhibiting, or treating those nerves you would also have an effect upon the lungs and heart, which are supplied by the pneumogastric nerves, an effect which would be bad. Such has not been the experience at all, and you are not in danger, in treating the pneumogastric in such a case, of having a bad effect upon the heart and lungs, supposing them to be normal, because your treatment tends to restore the abnormal intestine and liver to the normal, while it tends simply to have the effect of exercise upon the other parts. Again, you might have a stomach case in which the splanchnics were involved, and one who was very careful over questions of theory might want to know whether treating those nerves would have a bad effect upon the kidneys. Experience shows that such would not be the case. Or, for instance in the case of eye trouble, you frequently find that the terminal branches of the fifth nerve, emerging from the supra-orbital foramina, are very tender to the touch, probably on account of a secondary lesion there, abnormal impulses coming from that nerve terminal causing the tissues about the foramina to contract and impinge upon the nerve, thus keeping it tender. That may be the cause of it. Now in treating there you simply remove the contraction about the parts, you stimulate the blood vessel and the nerve, and remove the soreness. You would not be afraid of interfering with the nutrition of the eye, which is innervated by the fifth nerve.

This will serve practically to explain the effects obtained by those who are not entitled to the right to practice Osteopathy, certain of those who have seen the pecuniary benefits of Osteopathy and gone out without proper equipment, and have become what Dr. Still calls "engine wipers," and I presume others who have had better opportunities may work in the same way. That is, they work all over the patient, and work pretty near half an hour, so the patient will think he has had a good treatment, so that if there is a place to be treated he will be

sure to happen upon it. That is the way the Osteopathic quack works in most instances, taking into consideration that the effect is toward the normal, he gives a stimulating treatment all over the body, and if he strikes a few lesions they may be helped, as the tendency is toward the normal. That will explain how he happens to get results in some cases. Our work is to remove the lesion, and not to be afraid that we disturb the normal conditions.

Further, concerning work upon abnormal parts, it is considered as a principle in our practice that we should WORK AGAINST THE RESISTANCE WE MEET. That is a little hard to explain, and it is not a principle which will apply as generally as some others. Move the part in the direction in which you will cause the unnatural tension to appear. Because if by moving the part in a certain direction, as for instance, flexing the limb, you find that there is an unnatural tension opposing the normal movement, you then see you have a lesion with which you are dealing, and in working against the unnatural tension you are working against the lesion, at least in some cases. This, then, becomes a method of how to work to remove certain lesions. Dr. Harry Still says he always "springs the part," as he expresses it, in the direction to cause the most pain. Frequently you will find that the manipulation that you put upon a part will be diagnostic in part, and that it will often reveal to you certain lesions of the kind I have described. Remember, that in such cases your cue is the pain that you find. For instance, I might find a contraction in the piriformis muscle in case of sciatica. The cause frequently of sciatica, from our standpoint, is a contraction of this piriformis muscle in such a way as to impinge upon the sciatic nerve, which runs under it. So that you will then have an abnormal tendency to external rotation of the head of the femur, and the movement that we adopt is of such a nature as to stretch the piriformis muscle. The same thing is seen in stretching the ligamentum nuchæ, or the stretching of the sterno-mastoid muscle. I have seen cases in which that muscle was stiffened and contracted, in wry neck, and the treatment was to stretch the muscle. This will illustrate what I mean when I say to work against the resistance which you will find, and that that is a cue to the lesion itself. That may not be a primary lesion, it may be a secondary lesion, as in the case of the sterno-mastoid, the primary lesion may be something affecting the spinal accessory which innervates that muscle, but at any rate it has set up a certain trouble which must be corrected. That is not, as I said, a general principle; you cannot apply it everywhere; it applies especially to parts which may contract and thus form obstructions. Do not be too eager in carrying out this idea, because you may irritate the parts.

In the removal of lesions the question of STIMULATION OR OF INHIBI-

tion becomes secondary, since the lesion being removed, Nature tends to the normal. Nevertheless, there come times in our practice when we must either stimulate or inhibit according to the rules laid down. As, for instance, after we have removed the lesion and we have still to treat the parts to strengthen them, the question arises once more, what shall we do in this case, stimulate or inhibit? Our work is not entirely confined to the removal of lesions. Sometimes the lesion is not apparent, and we have to go to work at the innervation of the parts and get the results that we desire, either by stimulation or by inhibition. The disease may be of such a nature that this will be the rational method of treatment. Not that we should not look for lesions always, but sometimes we have to work directly upon the nerves. For instance, in diarrhœa or flux, their abnormality must be of nerve force, it frequently happens that we simply have to treat that case by strongly holding the spine; that is, inhibiting the sympathetic nerves, even though we may not at that time correct some lesion in the spine. I frequently inhibit strongly all along the lumbar region, and I certainly did nothing there but inhibit nerve action. In obstetrics the parturition center is stimulated at certain times to cause the contraction of the circular fibres of the uterus; we are not removing a lesion in that case, we are stimulating to bring about the desired end, and are working upon the nerves which control those muscles. In some headaches we cannot find any particular lesion; we very frequently go to the sub-occipitals and inhibit them—the sub and great occipitals. In the case of epistaxis we must stimulate in the neck; or in the case of hiccoughs, which is a very good example, we often do nothing but inhibit the phrenic nerve by pressure. The point is well taken, that we must sometime stimulate or inhibit without removing lesions, either after removal of lesions, or in the absence of discoverable lesions. That then brings up the point that there must be some different movement which we employ to stimulate or inhibit. The difference in stimulation and inhibition is well illustrated by a simple phenomenon—a very slight touch over different parts of the body will cause a tickling sensation, which may become almost unbearable; whereas a firm pressure at the same place removes the conductivity of the nerves, or inhibits. The other was a stimulation. In general the movement used to inhibit is a holding or pressing motion. I will show you that later; a holding or pressing motion, having as its end in view the idea of quieting the excitability of the nerve, that is, the lessening of its conductivity, which is done by pressure. We have seen that to be a fact according to the authorities. Thus, in pressure upon the phrenic nerve, we quieted the spasm of the hiccough.

In general, alteration of pressure and a relaxation of pressure, is used to stimulate, the idea being to excite, to titillate. This is com-

parable to the "making and breaking" of an electric current. We use alternate pressure and relaxation, and the idea is to in that way arouse nerve force. For instance, in a case of nose bleeding, we have to rub the superior cervical ganglion, and thus stimulate the tonicity of the blood vessels. In stimulating we work frequently along the spine, described as working hard and fast, making and breaking. We keep working in that way. We do not adopt the pressing motion, what we use in a quick, stimulating motion. That is the Osteopathic view of how we stimulate or inhibit. That is the technique of manipulation. Perhaps I do not fully agree with all the physiologists say on the subject of stimulation or inhibition, but I think I have shown that we have a pretty good allowance of authority, from quotations made, and that is the way we get results. This, then, would naturally bring us to consider the question of the degree of force that we should use. It is certain that you can stimulate so assiduously that you can get the opposite result, and finally inhibit instead of stimulate. The secret of it is that stimulation must amount to irritation, which if performed too frequently or too hard will, after it has run its course, result in the nerve refusing to respond to the usual stimulus, and finally to respond to any stimulus if the irritation is carried far enough. So that stimulation may become irritation, and finally inhibition.

You must remember in treating a patient to adapt the DEGREE OF FORCE to the end in view. This refers not only to the treating of a case, how hard to treat at the time, but the treating of a case too often. A great many cases want to be treated too often. A patient comes into your office, and you tell him, "I want to see you not more than once a week, in your case I can do you as much good in treating you once a week as I could treating you three times a week or every day." That is a fact, but the patient wants to get all he can for his money; he says, "You are charging me twenty-five dollars a month, and I think I ought to get more than four or five treatments; that makes it come pretty high, and I would like at least two treatments a week." And it is almost impossible to prevent treating too frequently, but when you do of course you are in danger of irritating. As I say, you must explain to the patient that by treating so often you irritate these nerves and structures and thus keep up an abnormal condition instead of removing it. You might also say that it is not you who cures, but Nature; you simply aim to assist her. Now, if you should treat so often, tell him you do not give Nature time enough between times to work, and that you do not think it best. You have to learn the arguments that apply to such cases, as you will meet them frequently. When you say to Nature that you will aid her so much that she does not have to work at all, she finally gets tired of the effort, "lays off," and lets you do what you can. We

had a case in Chicago of neuralgia of the fifth nerve which was treated once, and it disappeared for quite a long time. It finally returned and was quite a severe case, as hard a case to treat as any that I had ever seen. We tried all sorts of treatment and finally got to treating it pretty nearly every day, but it did not do much better. Finally we told the gentleman not to come back to us inside of a week or two weeks. We had by this time quit taking his money, but were trying to do what we could for him, so he was willing to do that. The result was improvement. We had simply stimulated until we had irritated and kept up the abnormality.

Then, again, some lesions must be removed only gradually. If you go to work and remove the lesion instantly, you do not give Nature time to accommodate herself to the changed conditions. Nature has been for years at work trying to adapt herself to the unnatural condition of things, and she has done so to a greater or less extent finally, and now you, as an Osteopath, try to change all that in a second's time. It can rarely be done. I have known of some cases where a very quick change could be made, but it is not a very common occurrence. I have heard Dr. Harry Still state that he had set a hip too soon and he had great difficulty with it until he had gotten it out again, because the muscles were all so contracted by being adapted to the abnormal conditions. They would not relax as they would normally have done, when the hip was in place, and he had great trouble to get it out again. The lesion should not be reduced too soon. In a case of asthma Dr. Still says we should not treat oftener than once in ten days or two weeks, because by frequent treatment we keep up the irritation.

I wish as soon as possible hereafter to take up certain centers and the consideration of the sympathetic system that I left aside after the first few lectures, as it is an important subject. There are certain things which I wish to bring to your attention to-day in regard to them. Remember that stimulating accelerator fibers accelerates and stimulating inhibitory fibers inhibits. For instance, if you were to treat the heart and wish to stimulate its action, you will recollect that there are two sets of nerves innervating the heart; one the sympathetics, and the other from the pneumogastrics. The sympathetic keeps the heart running and tends to run it too fast, while the inhibitory influence of the pneumogastric is to bring about an equilibrium between the forces, and keep it running just right. If it is not running just right, not fast enough, you will need to stimulate it, in which case you would stimulate the sympathetic supply to the heart through the upper dorsal and the cervical ganglia, and you would inhibit the pneumogastric, so as to remove the inhibitory influence. You would thus, according to the theory, get a stimulating effect upon the heart. If you wish to quiet the heart's action you would adopt just the

opposite plan of treatment. That will illustrate the fact that stimulating a nerve stimulates it to its action whether its action be that of an accelerator or an inhibitor. Stimulating vaso-dilators dilates. Stimulating vaso-constrictors constricts. This is very simple and perhaps it seems unnecessary to call it to your attention except in the connection it has with these other things.

There are certain things to remember in relation to the vaso-motor system, and which though hard to explain are of a great deal of importance to the Osteopath. There are certain things concerning the centers and the fibers. It is said that vaso-motor fibres are present in some cranial nerves, for instance, the chorda tympani of the facial nerve. The chorda tympani is the vaso-dilator of the submaxillary gland. The *general vaso-motor center* is in the medulla. It is said by Howell's Text Book, however, that that center is a constricting center, from which a continual constrictor impulse goes to all parts of the body, preserving the proper tonicity of the blood vessels, but he says it is not proven that there is any vaso-dilator center in the medulla. Simply not proven; there may be, however. The *vaso-constrictor fibers*, as before stated, leave the spinal cord from the second dorsal to the second lumbar, while *vaso-dilators* leave the cord all the way along, being not limited to certain places.

We frequently meet with the terms in description of the circulation, increase of *blood pressure*, and so on. Remember that stimulating vaso-constrictors constrict the blood vessels, and thus lessens the quantity of blood in that part, but it increases the blood pressure. On the other hand, the vaso-dilators loosen the vessels and allow more blood to go to the part, but decrease the amount of blood pressure. I thought I would call that to your attention so you would not get those facts confused.

A further fact that you must take into consideration is that sometimes a single anatomical nerve will contain more than one kind of fibres, vaso-dilator and vaso-constrictor fibres. That is true in the case of the sciatic nerve, and the result you would get in stimulating the sciatic nerve would be an average result between vaso-dilator power and vaso-constrictor power. Again, sometimes stimulating a center will produce vaso-dilation and sometimes vaso-constriction. You might have a vaso-dilator center and expect it always to produce vaso-dilation, but according to Howell's Text Book the center is sometimes changed in condition, and you get the opposite effect by its stimulation. Vaso-constrictors are less easily excited than vaso-dilators. Vaso-constrictors degenerate more rapidly when injured. The maximum effect of stimulation is more readily reached in vaso-constrictors than in vaso-dilators. Vaso-motor nerves are axis cylinders of sympathetic nerve cells. The pilo-motor and secretory fibers we shall consider later when speaking of the structures in which they terminate. As we cannot be certain

of all these things we have to depend more than ever upon the tendency toward the normal—we cannot always work to get a set vaso-motor or vaso-dilator effect.

II. TREATMENT OF THE NECK.—(*Continued.*)—The *spinal accessory, pneumogastric* and *glosso-pharyngeal nerves* emerge at the jugular foramen. We frequently have to treat them, especially the pneumogastric and the spinal accessory; the pneumogastric perhaps more often. We treat them in various ways. We can reach the pneumogastric by deep pressure over the exit from the skull—deep pressure just blow the mastoid process will affect the nerve. Some work there. Others work on the pneumogastric by stimulating all along the anterior border of the sterno-mastoid muscle. Thus you get a sort of massage and direct mechanical pressure upon that nerve, and no doubt affect it there. Another very good way to reach these three nerves is through the superior cervical ganglion. That is, we work on the superior cervical ganglion to affect them. We may affect the superior ganglion by working on the sub and great occipital nerves. That is rather an indirect way, but it is claimed that we get an effect upon those nerves by working in that place. That is the method Dr. Hildreth uses to reach those nerves.

There are various ways in which we reach the *phrenic nerve*, one way is to carefully find its location opposite the transverse process of the third, fourth and fifth cervical vertebræ, and impinge back upon them, thus pressing the nerve against the transverse process. That is one way. The way that Dr. Harry Still treats the phrenic nerve is by thrusting the thumb behind the clavicle and the first rib above; that is, thrusting it above the clavicle, behind it and the first rib, then pushing the bent arm and hand back over the shoulder in this way, thrusting the thumb in deeply at the sternal end of the clavicle and holding in order to impinge upon the nerve and lessen its conductivity, thus inhibiting the action of that nerve. It is sometimes reached by pressure at the sternal end of the clavicle. You can either press in the fonticulus gutturi, slightly backward, or between the sternal and clavicular ends of the origin of the sterno-mastoid muscle, backward and inward, to impinge upon the nerve. The best place to treat it is the best place that your practice tells you you can reach it. Different ones treat in different places, and it also depends upon the patient, as to how thick or how thin his neck is.

Next we will consider the treatment of the STERNO MASTOID MUSCLE. We can get a direct pressure by working along its course. It is very readily worked upon in this way, relaxing it and drawing it toward you without rubbing the fingers over the neck. Another way is to follow the obliquity of the muscle and turn the head, thus stretching the muscle on the same side. Remember that, on account of the obliquity of the

splenius capitis and the superior and inferior oblique muscles behind, you will at the same time stretch them, and I find that a very good plan in giving the neck a general treatment, as I will show you later. Of course you may have some trouble with the spinal accessory nerves causing a stiffening of the sterno-mastoid, in which case you must give it attention.

Now as to treating the neck proper, or the back of the neck. The first thing is to *loosen all of the muscles*. In giving this treatment I always use the flat of my hands, lay them directly on the neck, and have thus a broad hold and do not run any risk of hurting by pressure with the tips of the fingers. I usually go to work in this way and work straight backward, thus loosening all of the muscles, giving a certain twist or turn as I work. You will be able to recognize by the sense of touch when you have relaxed everything. It is also good to relax the muscles by working from the side. Remember above the third cervical to work upward, and below it downward. I relax all the muscles that are hard. Then when you have them thoroughly relaxed, it is a good idea to still further relax the deeper structures by a *straight pull*. I hold beneath the jaw and occipital protuberance and draw the patient gradually toward me, that stretches the neck. I have warned you *not to turn* it while stretching it in that way. I then turn the neck strongly from side to side in this general treatment of the neck, loosening all the deeper structures, stimulating all the parts about the vertebræ, and loosening the ligaments. Then before finishing the neck I usually stretch the ligamentum nuchæ and also the other ligaments about the vertebræ, as I have already shown you how to do.

*It is an important question how to treat the CERVICAL GANGLIA OF THE SYMPATHETIC. As I said, we usually affect them by treating the sub and great occipital nerves, that is, by pressure in the sub-occipital fossæ. The way in which we inhibit their action is by holding deeply in those fossæ and then turning the head from side to side, rotating it as you go; and you thus work deep into the parts trying to get direct pressure upon the sub and great occipital nerves. Through their connection with the cervical sympathetic you influence it. Some operators treat that way almost entirely and results would indicate that they were accomplishing what they were attempting. You must not be in a hurry, but turn the head slowly from side to side and hold firmly. Some treat the first ganglion directly by pressure opposite the second and third cervical vertebræ, a little in front and backward, thus impinging it against the hard parts of the spine *beneath*. In the same way you can reach the second one, the third I think you cannot reach from the front of the neck,

*See appendix 7.

that must be reached indirectly through sympathetic connections with the spinal nerves behind.

To stimulate these ganglia, pressure and relaxation are employed.

In treating AN ATLAS we use a combination of motions already shown, that is, a thorough loosening of all the parts. Then by traction, rotation and pressure upon the prominent part you can work it back into its place. Of course it takes time, and frequently has to be done very slowly. That same method can be pursued for all the cervical vertebrae. It is something you will have to learn by experience. Another way to set the atlas is with the patient sitting on the chair. This is a move that Dr. Still showed us not a great while ago. He puts his knee under the jaw and rotates the head in a direction to throw out prominently the part which is out of place, and then placing his thumb or fingers upon that part, rotates the head back again, the idea being extension and flexion in such a way as to disengage the articular processes and allow the part to resume its normal position.

In order to work out the *sore places* that you will frequently find in the sub-occipital fossæ and just beneath the occipital protuberance you should relax all the parts, both the ligaments and the muscles.

I will now show you how I usually work upon the neck; I will work just as if I had come in and found this neck in a generally bad condition and wish to relieve it. The treatment of the neck is a very important thing. You need not be afraid of getting down close to the shoulder and stretching all of those muscles. It is a good thing to get the head against you and push downward as you turn, you can thus sometimes relax the parts and start the vertebrae toward their normal position. It takes considerable time to treat a neck thoroughly and well. One thing which I did not mention is that you can stretch the scaleni muscles very readily by holding the head straight and without turning it, pushing it directly to the side. If it is a case of headache, I save the inhibiting movement until the last, and by holding firmly in the superior cervical region, particularly at the sub-occipital fossæ, I get good results.

Q. You were speaking of stretching the pyriformis muscle. Please show us how that was done.

A. That muscle is an external rotator, and an extreme internal rotation will be all that is necessary to stretch it. Work opposite to the defect.

LECTURE XVI.

At the last lecture I invited your attention first to the general principle of our treatment, that manipulation always tends to restore parts to normal, following it out along the idea that therefore should we manipu-

late a part which was not diseased, we need not be in any fear that we would make it abnormal, because the tendency would be to excite it in the way that normal exercise would excite it. But we by manipulation of the abnormal, on account of this tendency, result in tending to the normal and in helping to cure the disease. This is a partial explanation of why our friends, the "engine wipers," who work over nearly all the body, and work for nearly an hour, can get some results, when they are not Osteopaths at all. Another point was that you should take the pain as the cue, and move the part or stretch it in the direction in which you meet the resistance, since thereby you work against the lesion. I explained about how general that should be, that you should not irritate in so doing. Although the question of stimulation and inhibition is a secondary one to removal of lesion, we sometimes stimulate or inhibit irrespective of lesion or after removal of it. In general, we inhibit by pressure, by holding; we stimulate by brisk work similar to making and breaking of an electric current, and there was a question of degree of force; you might stimulate hard enough to inhibit. There were certain elementary points concerning nerves which I thought would be profitable to bring to your attention; that stimulating an accelerator nerve accelerates, stimulating a vaso-dilator dilates, stimulating a vaso-constrictor constricts. I also called certain centers to your mind, the fact that the center in the medulla is a vaso-constrictor center, and that a vaso-dilator center has not been found to exist, although it may be there.

I. THE PHRENIC NERVE. What I wish to-day to do is to notice more particularly something concerning the phrenic nerve. You all know its location and treatment; how it arises from the third, fourth and fifth cervical nerves, especially the fourth, having some branches from the third and a recurrent branch from the fifth; that it is reached in different ways, being impinged against the transverse processes of the vertebræ, or being reached at the fonticulus gutturis, or behind the first rib and the clavicle; that it is important to us, but has been so mainly as a means of stopping hiccoughs. However, I think it should be of greater importance to the Osteopath, and while I have not heard these matters brought out that I am going to bring out this afternoon, yet I mention them in the way of suggestion for further work. Perhaps I do not know all that others have done with the phrenic nerve; these points are more in the manner of theories, but if what I have already said is true, certainly the phrenic nerve has considerable importance to us as an adjuvant to our work.

The phrenic nerve has important connections with the sympathetic system. Gray says that the phrenic nerve supplies the pericardium and the pleura by filaments; that in the thoracic cavity a filament is sent from the sympathetic to join the phrenic nerve, and that there are also branches

to the peritoneum. From the right nerve there are branches to the phrenic ganglion, which is situated just below the diaphragm, the terminals, of course, perforating the diaphragm to reach this phrenic or diaphragmatic ganglion of the sympathetic. This ganglion of the sympathetic is connected with the solar plexus. This ganglion sends branches to the hepatic plexus, and also some filaments to the inferior vena-cava. Its function as a spinal nerve is to supply the muscle of the diaphragm. From the left nerve branches go to join the solar plexus, but there is no ganglion formed.

Quain substantiates those points, and says further that branches reach the phrenic in the neck from the middle or the lower sympathetic ganglia, some branches going to the pericardium, and that from the right nerve were branches going to the inferior vena-cava, both above and below the diaphragm, and that branches also go to the right auricle of the heart. Pansini, according to Quain, has found in animals that the phrenic plexus of the diaphragm is participated in by the lower three intercostal nerves. You will see that the purpose is to associate the muscles of respiration, the abdominals, intercostals and the diaphragm itself. Quain states further that the phrenic may have a branch from the hypoglossal nerve and from the fifth cervical nerve. Such are the facts in relation to the phrenic and its distribution. When we examine those facts in the light of Osteopathy, it seems certain that we find the phrenic significant to us in more ways than one. You see from what I have said that the phrenic is connected with the sympathetics; first with the middle or lower sympathetics in the neck; next that it receives a filament from the sympathetic in the chest; next, that it perforates the diaphragm to join the nerves of visceral life, those on the right running from the diaphragmatic ganglion, those on the left joining without the intervention of a ganglion. You notice further that it has a connection with a cranial nerve—the hypoglossal; that it has branches connected with the brachial plexus, that is, from the fifth cervical; and that it may perhaps join with the lower three intercostals, but I do not know that that has ever been shown to be true in man. The conclusion is obvious, then, from what we know of the connection of nerves in different parts of the body, both sympathetic and otherwise, that if any of these sympathetic, spinal or cerebral nerves were diseased, the disease might conceivably be extended to the phrenic and effect it, and that we might have phrenic symptoms arising from these other troubles. The reverse, of course, is true, and that any of these structures which are supplied by the sympathetics or these other nerves, may reflexly be affected by the phrenic nerve when diseased. You have seen that it supplies the pericardium, pleura and peritoneum, that it supplies one of the great blood vessels, the inferior vena-cava, and sends branches to the right auricle of the

heart, and there is no reason, according to our theory, why disease in any of these situations might not affect the phrenic nerve, and you might have symptoms of disease in the phrenic nerve. So that our theoretical rule is certainly a good one, for it will work both ways, either affecting the phrenic nerve, or the other structures, as the case may be. The importance of this to us lies in the fact that it would be an adjuvant in the treatment already used. It is one more path by which we can influence nerve force. We have certain ways of reaching the abdominal viscera, through the splanchnics in the back; we might have a case that we could not effect in that region, but if we could reach the trouble through the phrenic, we would accomplish the desired result. As I have said, these facts are not fully demonstrated, but it is a theory which I leave for your consideration, and which you can work on in your practice. It comes to us as another key to unlock the doors of sympathetic life; another way in which we can work; another tool in our hands.

I wish to call up what Dr. Hilton says in regard to the phrenic nerve; he sets out very clearly why it is that it perforates the diaphragm and is distributed on its lower surface rather than upon its upper surface. He shows that were it distributed to the upper surface the nerves would then be impinged upon by the lungs, and you would have constant interference with nerve force, but it is distributed on the under side of the diaphragm, where it is removed from the tendency of pressure of parts above, and the tendency of the force of gravitation is to draw away the stomach, liver and spleen from the under surface of the diaphragm, so that there can be no interference with the plexus situated below the diaphragm. Dana makes use of this tendency of gravitation in the case of hiccoughs, but in a somewhat different way. He states that it has a very effective action in hiccoughs. He places the patient on a table with his head down over the edge of the table, that would allow the thorax to arch up, and the action of gravitation would allow the heavy viscera to impinge upon the under surface of the diaphragm, and it would in that way be helpful in stopping hiccoughs, by inhibiting the nerves of the plexus. Hilton does not explain it so. It may be that the stretching of the thorax, thus extending the contracted muscle, would by its extension send an impulse back over the nerve and quiet the spasm. I have not heard it explained why the drinking of cold water stops hiccoughs, but there may be an explanation here in connection with the sympathetics; that the action of the cold water may be such as to for a while inhibit the action of the sympathetics, sending an action reflexly back to the phrenic from its sympathetic connections, and thus causing the spasm of the hiccoughs to be released.

So in our work upon the abdominal viscera we may avail ourselves of the advantage of work in the neck on the phrenic. Dana states that he

treats diaphragmatic palsy by electricity applied to the neck. He says there is a motor area in the neck which is readily affected by the electric current. It no doubt corresponds with the work we do when we bring pressure directly upon the phrenic nerve.

I wish to quote from Dr. Jacobson along this line as follows: "Another reason for the phrenic nerves traversing the diaphragm, and breaking up into branches on its under surface, may be to enable them to come into communication with the sympathetic or visceral nerves of the abdomen. From this communication branches are given to the hepatic and solar plexuses, and the inferior vena cava. Everyone knows the value of active exercise when certain abdominal viscera are torpid in the performance of their functions, e. g., in constipation, biliousness, etc. The perforation of the diaphragm by the phrenic and its communication with the abdominal sympathetics must bring the brain and spinal cord, the diaphragm and abdominal muscles, so important in active respiration, into intimate association with the subjacent viscera." So says Dr. Jacobson. Hence, we see that we can go farther, and say, that since the brain and cord are thus brought into connection through the phrenic with the sympathetics and with abdominal sympathetic life, and since the brain must send certain impulses along those nerves and thus affect abdominal sympathetic nerve life, there is no reason why the reverse may not be true. Why may we not affect the brain and cord by working back from the sympathetics, and more particularly when there is a lesion, because manipulation must tend toward the normal? You would manipulate the phrenics; the abnormalities would be affected, you would affect the phrenic, and thus be more likely to affect other nerves which have under control that which has become abnormal. There is no reason, according to our theory, why we would not tone up the whole mechanism of respiration, especially the muscular respiration, since it is in connection with the phrenic nerve and with the abdominal sympathetic.

I emphasize once more what I have said frequently before—that work upon nerve terminals will affect the nerve itself, and will affect the center from which it comes. I think that position taken by Osteopaths is impregnable. I wish to quote from Dr. Hilton in a case of pain in the knee, where the trouble was in the hip, which the Osteopath often meets, and which shows us that doctors are not always in the dark in their diagnosis of these cases. Dr. Hilton says: "We find some patients with hip-joint disease suffering from pain in the knee. Now, although the disease does not lie there, we know that the pain can be relieved by a belladonna plaster, or strong hemlock poultices, or fomentations applied over the knee-joint, thus acting upon the nerves of the hip-joint through the medium of those which are spread over the knee-joint." He has made the point previously that the nerves of a joint supply also the skin over the joint and over the inser-

tion of the muscles which move the joint. So you have one nerve going to a joint, to its muscles and to the skin over those muscles. We see that the therapeutic value of work upon nerve terminals has been recognized and used long before this. Our method is peculiar in this; that it works upon nerve terminals exclusively by manipulation and its effects.

Perhaps some of you have heard of certain exercises for troubles of the stomach, bowels, liver, etc. It is recommended that the patient who has torpid liver should every morning get down on all fours, that is, keeping the legs straight, and on the hands and feet run briskly around the room, that if he would do that it would press the liver and squeeze it like a sponge and could not help but stir up the torpid circulation from the portal system. There is another stooping motion given in which the patient keeps the back straight, bends his knees and allows his body to sink down straight, then he can bend so that the shoulders touch the knees. You will notice that it is a sort of pumping motion, it will stretch the spine and knead the bowels and abdomen thoroughly. Often this may be of practical use, and you might suggest it to patients with similar troubles. Now, what would be the effect in such a case? I do not think it would be simply local in pumping the blood through the abdomen and its contents. I think that the tendency there would be to affect the nerve supply, if our work and our theory go for anything, and to affect generally the abdominal nerves, and through them the centers, which may themselves be in an abnormal condition. The tendency continually toward the normal would tell us why work upon the abdomen should affect cerebral centers and thus restore them to the normal. We had quite a marked case in Chicago some time since. A lady patient told Dr. Sullivan that she had been treated by an Arabian doctor, who adopted a queer method. She said he had directed her to fix her mind upon the point in view every day at a definite time, and he had given her particular instructions as to how it should be done, and she said she was perfectly restored from constipation. The explanation given was that by thus working on the mind this doctor had finally led his patient to gain control of the cerebral center which has to do with these functions.

I have already examined the neck before you, and shown you how to treat it. We are ready to take up the head. I may say in passing that it is my idea to first go over the body part by part, giving you the examination and treatment for all the different portions of the body. That is a piecemeal way to do, but it will give you an analysis of the whole. After I have done that, we shall have a synthesis, and I will take up special diseases, and show you how to examine and treat the case, combining different movements and treatments according to circumstances.

II. LANDMARKS OF THE HEAD. Holden notes the following: That the *scalp* is very tough and dense on account of its close connection

with the aponeurosis. That its density, therefore, often obscures the growth of tumors upon the cranium. A *tumor* beneath the aponeurosis may very readily be confused with a growth from the scalp itself, or from the brain, and in general such tumors are firm and resisting. Other tumors that are above are very readily movable, and when they are movable I believe the point is general that they are not so serious. The *supra-orbital artery* is felt pulsing just above the notch. You all know where the supra-orbital artery is, at the junction of the inner and middle thirds of the supra-orbital arch. It runs thence up over the forehead, and by carefully feeling you will be able to note the pulse.

The *temporal artery* is felt an inch and a quarter behind the external angular process of the frontal bone. The *occipital artery* is felt near the middle of a line drawn from the occipital protuberance to the mastoid process. The *posterior auricular artery* is felt pulsing near the apex of the mastoid process. I think to feel for the different arteries at different places is a very good way to train the touch.

It is said that the *skull cap* is rarely exactly symmetrical. The prominence of the frontal, parietal and occipital portions of the cranium is a partial indication of those respective parts of the brain, and it is stated a good way to measure their relative proportions is to pass a string from one external auditory meatus to the other, first over the frontal, then over the parietal, and then over the occipital eminences, and thus you can get an idea of the comparative bulk of these lobes of the brain, because it is said the lobes of the brain correspond in general to these parts.

The *anterior fontanelle* in the infant, you are familiar with. It should be carefully noted whether the condition is a hill or a hollow. Of course normally it is even. If it is a hill it will indicate too much cerebral fluid present, as in hydrocephalus. But if there is a wasting of the fluids of the body, as in diarrhea, you may have a hollow there. Normally, the rate of the pulse-beat may be counted at the fontanelle of a sleeping infant. The *frontal sinuses* do not gain their normal size until after puberty. The absence of them is not indicative of much because they grow inside, or if they are very prominent it may be simply a heaping up of the bone and a degeneration.

The *mastoid process* is filled with air cells, lined with mucus membrane, and it may develop as other mucous membranes do, a catarrhal condition, which may lead to suppuration. The *occipital protuberance* is the thickest part of the skull; about three-quarters of an inch thick. The part at the *temple* is the thinnest, and may be as thin as parchment, it is stated. The *external auditory canal* runs slightly forward and inward, hence in examining you must pull the auricle backward and upward.

*MARKS FOR THE FACE:—The three points of the *three terminations of the fifth nerve* are at the supra-orbital, infra-orbital and mental foramina, respectively. A line passed from the supra-orbital foramen, between the two bicuspsids, will pass over the remaining two foramina. Nerve terminals are important with us, and we get an important effect on the fifth nerve by working on these terminals. The two lower foramina look toward the nose.

III. EXAMINATION OF THE HEAD AND FACE:—I do not need to state to you that the examination of the head and its parts, embodying as it does, the eye, ear, nose, and throat, upon any one or two of which some spend a lifetime of study and work, lecture and treatment, can be encompassed by a few lectures. We all recognize the importance of the subject. However, I think we can take a general view of this subject now in a few lectures and depend on later lectures and later experiences to enlarge upon our knowledge. The Osteopath has good success with troubles of the head; brain troubles, diseases of the eye, ear, nose, and throat, and diseases of the face. His treatment is very simple, being for the greater part in the neck. Troubles of the eye and ear are, as you know, closely associated with the superior cervical ganglion of the sympathetic, and with the various vertebræ. Dislocations of these vertebræ are very important. The atlas will affect the ear, and the atlas and upper cervical will affect the eye. So that in any examination that you make of the head and its parts you must do it in connection with the neck. Remember that the separation of these subjects has been merely for convenience, but that all work together. For instance, you may find a catarrhal condition of the head where the cause may be entirely in the neck. You may have a case of insanity where the trouble is wholly in the neck. With these remarks I think you will note the importance of examining the neck, and of treating it in connection with head troubles.

In examining a patient at any time you should note the size and shape of the *head*; you should look for the presence of tumors or ulcerations upon the scalp or beneath it, and also carefully examine to see if the head is bald. Always notice the *face*, as it is a great indicator of disease; notice the countenance, and the *expression*. You will frequently meet in medical literature the fact that the patient has a worried expression. Different diseases affect the countenance differently, and you will often meet this anxious expression of countenance, so that is an important indication, as is also the complexion. You have all seen the complexion of jaundice; stomach trouble will have its effect upon the complexion; certain diseases of the genitals will cause eruptions on the face. These things you will bear in mind. In looking at the face always note the *lower jaw*. It is

*See Appendix 8.

especially important from the Osteopathic point of view. It may be slipped backward or forward or it may be deviated from one side, and in being so may cause a tightening of the ligaments of the jaw causing serious results. It may affect the ear, or it may have something to do with neuralgia of the fifth nerve.

*In looking at the EYE, always notice the *conjunctiva*, whether or not it is engorged with blood, whether or not it is yellow, whether there is any growth upon it, or any abnormality whatever concerning it. Note whether or not the eye is brilliant; in some it is dull. All of these points should be significant to you. There may be growths upon the eye, *e. g.*, *pterygium*, which has been successfully treated by Osteopaths. You may find *cataract*; we have had some success in curing this also by Osteopathy. It is well in examining a patient to note whether or not the *iris reflex* can be obtained. Dr. Harry Still always says there is considerable hope for an eye if you can find on examination that the iris will readily dilate. He taps the closed eye, putting one finger upon it, tapping it three or four times gently with another; if that has caused the iris to dilate you will know that the reflex is intact. You can also determine this by shutting off the light and then instantly turning it on, the reflex being manifest in the same way. You should in your examination of the eye note what is the *color of the mucous membrane*. A very pale color will indicate an absence of sufficient nutriment; absence of blood supply. In anemia the mucous membranes of the whole body are pale, hence you will need to examine the eye in health to acquaint yourself with these phenomena.

In examining the eye we have to turn back the *lids*, the under lid is very readily turned back and down, and you can examine it and notice if there is any foreign body upon it. The upper lid is not quite so readily turned back. You can do it with a pencil, or you can push it right up and back. Note the *meibomian glands*, and note whether or not there are any granulations or any foreign growths. It will be well for you to note whether or not the *tonicity* of the muscles about the eye is normal, holding the *puncta lachrymalia* against the globe of the eye. A growth may obstruct the *duct* producing the same result, and you want to know whether or not it is simply a loosening of the muscles or some obstruction in the duct. You may, in looking at the eye, discover a *foreign body*. Sometimes you can see it, sometimes you have to look obliquely across the cornea of the eye. It may be stuck on the cornea, and you will have to look at it by an oblique light to see whether the surfaces are clear. Looking at it obliquely will also enable you to see *pterygia*, although these are generally readily seen by looking at it directly. The presence of *dead lashes* is sufficient cause of disease; you can have quite a sore eye merely on account of dead lashes

*See Appendix 9.

being left in the lids. They should be regularly pulled out, and should be gently tried to see whether or not they will come out. It is said that if a person will keep them removed he will not have trouble with his eyes. When they have become lifeless you will see little black points on the eyelids. It is said a fullness under the eye is indicative of dropsy. The presence or absence of a ring about the eye is also indicative of the general health.

LECTURE XVII.

I spoke last time of the phrenic nerve, showing how it has connection with the sympathetic, and advancing the theory that very possibly important results might be obtained Osteopathically by working upon this nerve for the sake of influencing its connections, calling to your attention the fact that it supplies the peritoneum and pericardium; sends branches to the inferior vena cava, and a branch to the right auricle of the heart. It is also connected with the sympathetics below the diaphragm, and thus has very important connections with visceral life. It is also connected with a cranial nerve, the hypoglossal, and with spinal nerves, viz. ; the 3d, 4th, and 5th cervicals, and that in some animals connection had been noted between the phrenic and three lower intercostal nerves. This connection with the muscles of respiration is to cause them to work in conjunction. There is the theory supported by the quotation from Dr. Jacobson—that work upon, or exercises that would influence, the abdominal viscera, would thus have an influence upon the brain. It seems likely that by work upon these parts we can get an influence over the parts affected, and thus perhaps reach brain centers and gain an influence over them. I noted also the value of such exercises as stooping, those which would bring a squeezing motion upon the liver, intestines and stomach, and showed how it might through these nervous connections affect the parts which were at fault. I then explained certain points concerning landmarks about the head and face, and spoke upon the subject of how to examine the head, face and its parts. I wish to-day to continue that line of thought, giving particular attention to the eye.

*I. OSTEOPATHIC POINTS CONCERNING THE EYE:—We are aware that the nerve supply of the eye, which is itself a nervous organ, is various and important, and we shall see later in the lecture that we have quite a broad field upon which to work to reach the eye. I have already given you some centers for the eye and have spoken, in considering the

*See Appendix 10.

neck, about the blood supply to the head and its parts. We get our effect upon it through the nerves; the *superior cervical ganglion* is the chief center upon which we work to affect the eye. I have seen a case of "blood-shot" eye, as we call it, cured by treating in the superior cervical region; simply by inhibiting the action of the sympathetics at that place. So you see the superior cervical ganglion has an important control over the mechanism of the blood supply. We probably affect it through the *ascending branch* to the carotid and cavernous plexuses, and no doubt also through the connection which it has with the *fifth nerve*—the fifth nerve having important vaso-motor fibres to the eye. Quain, in his anatomy, describes branches from the cavernous plexus which run to the cerebral and ophthalmic arteries, forming a secondary plexus about them, and from them, he says, some branches go to the eye-ball and form a *plexus of the sympathetic* in the eye-ball itself. Hence, we have a very important and direct connection with the sympathetic through the superior cervical ganglion, through its ascending branches, and this terminal sympathetic plexus in the eye-ball. The *ciliary ganglion* is also important in relation to our work upon the eye. It has connection with the third and fifth cranial nerves and the sympathetics. The third and fifth nerves are important, as you will see later when I shall take that up more in detail. Concerning the ciliary ganglion, Quain says: "The ciliary, ophthalmic or lenticular ganglion serves as a center for the supply of nerves, motor, sensory and sympathetic, to the eye-ball." Thus we have a center on which we may work. Further, he says; "The sympathetic root is a very small nerve which emanates from the cavernous plexus." So the ciliary ganglion gets its sympathetic supply for the eye from the cavernous plexus. The ciliary ganglion lies at the bottom of the orbit between the rectus muscle and the optic nerve.

There is a treatment which we frequently give the eye, not tapping, but a **PRESSURE** of the eye back into its socket; and I think the effect there must be on the ciliary ganglion, and since it is connected with the third and fifth nerves, we could undoubtedly, if there were abnormalities, get an effect upon those nerves. Thus, working in this way, we might affect the third nerve and tone up the muscular mechanism of the eye, or working in this direction on the fifth nerve, we might tone up the nutrition of the eye. Thus by pressure we have reached not a nerve, but a center, and the reverse is clearly true according to our theory, that we might work upon terminals, as for instance terminals of the fifth nerve which are readily reached in the face, and in that way get an effect upon this ciliary ganglion which is connected with the fifth nerve. Or, by working, as we do, through the superior cervical ganglion to reach the third nerve, we might have an effect upon the ciliary ganglion, through its sympathetic connection. This will serve to show you how closely

connected is all this nerve supply to the eye. One is quite dependent upon the other, and in affecting the one you affect the other, provided it is in need of treatment. Thus by working on this theory you can affect not only sympathetic life, but sensation and motion of the eye, since these nerves send branches to the eye.

A little further with regard to the *third nerve* and its connection with the eye ball. It innervates all the muscles of the eye ball, as you know, except the external rectus and superior oblique. Through the ciliary ganglion it also rules the sphincter of the iris. Howell's Text Book states that there are fibres antagonistic to this motor oculi from the ciliary ganglion, which constrict the iris and lessen the aperture of the pupil. The antagonistic fibres to the motor oculi come from the third ventricle, through the bulb, the cervical cord, the anterior roots of the upper dorsal nerves, the upper thoracic ganglion, and the cervical sympathetic cord, and thus they join the ophthalmic division of the fifth nerve, passing through its nasal branch and its long ciliary branches to the iris. These antagonistic fibres must be dilators. Thus from the motor oculi you get the motor fibres to the sphincter of the iris, and from the region I have just explained you get the dilator fibres of the iris. Hence, we dilate the iris by stimulating the superior cervical ganglion or stimulating in the upper dorsal region, more particularly the latter. Quain, in speaking of fibres from the cervical ganglion, notes these centers; pupillo-dilator arising from the 1st, 2nd and 3rd dorsal nerves, then passing upward in the ascending branch of the superior cervical ganglion, reaching the Gasserian ganglion and the eye through the first division of the fifth nerve and the long ciliary nerves. He further says in parenthesis that it is stated by many observers that the pupillo-dilator fibers are contained also in the 7th and 8th cervical nerves. Motor fibres run to the involuntary muscles and orbit and the eye lids from the higher four or five dorsal nerves. Thus along the cervical region, from the superior cervical ganglion down as low as the 6th dorsal, you may get an important effect upon the eye.

Concerning the *FIFTH NERVE* and its connection with the eye ball, I have already noted its connection with the ciliary mechanism; that there are dilator branches from the cervical and upper dorsal through the nasal branch of the fifth, and that it has connection with the Gasserian ganglion. The ophthalmic or first division of the fifth nerve, which is sensory in function, joins with branches from the sympathetic derived from the cavernous plexus. This nerve supplies the lachrymal glands, the conjunctiva of the lids and of the eye ball, and the skin about the lid and face of that part. The fifth nerve is also very important in the nutrition of the eye, the face, and different parts of the head. Green's Pathology notes the fact that upon section of the fifth nerve keratitis, or inflamma-

tion of the cornea arises, followed by ulceration. Kirke makes the same statement, and says further that the disease may progress so far as to destroy the whole eye-ball. Kirke also states that in the case of the fifth nerve, the fact that there are trophic fibres in it is proven by experiments of Meissner and Buttner, who found that division of the innermost fibres is most potent in producing decay. Howell's Text Book states that vasodilator fibres for the face and mouth are found in the cervical sympathetics; that they leave the cord at the second to the fifth dorsal; that they connect with the fifth nerve by passing from the superior cervical ganglion to the Gasserian ganglion. Other dilator fibres for the skin and mucous membrane of the mouth and face seem to arise in the fifth nerve itself, also some in the nerve of Wrisberg. He states further that excitation of the cervical sympathetic causes constriction, excitation of the thoracic sympathetic, dilation of the retinal arteries. Thus by working from the cervical sympathetic, getting an influence along the path of the fifth nerve, you have a vaso-motor effect upon the retina. So you have not only trophic but vaso-motor fibres in the fifth nerve, supplying the eye. Quain states further that the retinal fibres, leaving the sympathetic at the superior cervical ganglion, pass to the ganglion of Gasser and to the eye from the ophthalmic branch of the fifth nerve, through the gray root of the ophthalmic ganglion and the ciliary nerves. Almost all of the trophic fibres of the anterior part of the eye are found in the fifth nerve, hence you can readily see the great importance that the fifth nerve bears to Osteopathic work upon the eye, because there is hardly any trouble in the eye which may not be influenced through the nutrition, and such troubles are within the reach of the Osteopath.

Taking into consideration the facts, then, we note first, that the eye is readily reached by the Osteopath in two ways: through its blood supply, and through its nerve supply. We note further that the chief points at which the Osteopath works to affect the eye are the third nerve, the fifth nerve, the superior cervical ganglion, the upper dorsal region, and also the ciliary ganglion; that, as I noted in the beginning, the superior cervical ganglion is the most important point upon which we work in treating the eye, since, as you have seen, it is connected with the third and fifth nerves, and also with the ciliary ganglion. Also that through it you get an effect upon the iris, upon muscles, and upon nutrition and sensation in general. The Osteopath certainly is not lacking for means of reaching the eye.

We note further that there is a *constrictor center* for the iris in the ciliary ganglion and in the superior cervical ganglion; that there is also a *dilator center* in the upper dorsal region and in the superior cervical ganglion. That is, dilator center for the iris. It may be a little confusing, that in the superior cervical ganglion you may have both a con-

strictor and dilator center for the iris. However we may contract the iris by working at the upper cervical region, and we may dilate it by working down at the second and third dorsal. That has been our experience, and although there seems to be a confusion of centers there we go according to results. We may work in one way upon the fifth nerve by treating the superior cervical ganglion, and we get an important effect upon the fifth nerve by working up its terminal branches. As I pointed out to you at the last lecture, the terminal branches of the fifth nerve are readily pressed upon at the supra-orbital and infra-orbital foramina, as well as at the mental foramen, and since we have shown that working upon terminal fibres is an important part of our work, and that through them we can gain important effects upon connected nervous mechanism, it shows that we have a good opportunity to reach and effect the nervous mechanisms of the eye through the fifth nerve.

I also noted at the last lecture the importance of examining the neck in any trouble of the eye or part of the head. If there is any dislocation of the atlas or of the third cervical, these points are particularly significant in regard to eye troubles, or there may be an interference at the inferior maxillary articulation—impinging upon fibres of the inferior maxillary division of the fifth nerve, and since in that way you may affect the whole nerve, it may have an effect upon the eye.

Byron Robinson quotes from Fox that, "Irritation of the peripheral end of the cervical sympathetic will cause a protrusion of the eye-ball, while section will cause a sinking of the eye-ball." There are fibres which aid in the control of the metabolism of the retina at the fourth and fifth dorsal. Strong stimulation of the nerves of the sexual organs causes dilation of the pupils and protrusion of the eye-ball.

II. FURTHER LANDMARKS IN REGARD TO THE PARTS OF THE HEAD AND FACE.—According to Helden we notice the following points. You will readily feel the *pully* of the superior oblique muscle by pressing the thumb just under the inner edge of the orbit. The *seventh nerve* has its exit from the cranium at the stylo-mastoid foramen. It then passes forward and runs into the parotid glands. It sends branches upward to the temple, toward the eye, the cheek and jaw. The *parotid duct* lies on a line drawn from the bottom of the lobe of the ear to midway between the nose and the mouth, and empties opposite the upper second molar tooth. It is accompanied by a branch of the facial nerve supplying the buccinator muscle. The pulsation of the *temporal artery* may be felt between the root of the zygoma and the anterior part of the ear. It is said that that is a very convenient place to feel the pulse of a sleeping patient. The *facial artery* is very important in our work. It passes over the inferior maxillary bone at the anterior edge of the masseter muscle, and is felt also at the side of the nose high up, as well as near the corner of

the mouth close to the mucous membrane. The *coronary arteries* are readily felt by placing the finger just beneath the lip against the mucous membrane; you can feel them pulsate on the inner side of the upper lip and on the inner side of the lower lip. The *facial vein*, instead of taking a tortuous course to follow the artery, runs directly from the inner angle of the eye down to the anterior border of the masseter muscles.

III. EXAMINATION OF THE EYE.—(*Continued.*)—I took this subject up at the last lecture, but there are some points that I wish to call to your attention in examining the eye. An unnatural luster of the eye is seen in fevers. An unnatural brilliancy is found in consumptives. A glassy eye in children shows inflammation of the mesenteric glands, and if it is accompanied by dark, dry lips and tongue and great restlessness, it shows an acute inflammation of the stomach. In fevers glassy eyes are a sign of great danger or of some serious change about to occur. Dull eyes are noticed in febrile conditions, during the catamenia, in catarrhal and other affections. Sunken eyes are due to the absorption of the fatty cushions, and indicate some loss of the vital fluid, hemorrhage or some exhausting disease. Exophthalmus, protrusion of the eye-ball, when not congenital, is said to be characteristic of Basedow's or Graves' disease.

In your examination of the eye you should bear in mind and see what parts of the eye are affected; whether it is the lid, iris or conjunctiva; whether it is a change in the eye-ball, whether the sight is affected, or there be a weakening of the nerves, or inflammation of the eye.

IV. TREATMENT OF THE EYE.—As I have said, the treatment of the eye Osteopathetically is quite a simple matter. In the first place, as I noted, we sometimes bring *direct pressure* upon the eye. We with one hand press gently upon the eye-ball, or you can lay your thumb on it and press downward. In that way, as I explained to you, you probably have an effect upon the ciliary ganglion, you would also mechanically excite the blood supply by pressure. You would have an effect through this pressure upon the optic nerve, since all these parts by being pressed back into the cavity would be more or less impinged upon. I noted that we sometimes gently tapped the eye, laying one finger upon the eye, and with another tapping three or four times very gently. The idea in that is to shock the optic nerve and thus stimulate it. In that way we also stimulate the sympathetics, and through them the blood-supply. We frequently, in treatment of the head, tap upon the frontal sinus, not very hard, for troubles with a branch of the fifth nerve which supplies that sinus, and from which you might have a bad effect upon the eye, causing some pain, which you might relieve in that way. We are frequently called upon to treat *granulated eyelids*. They are something that are readily treated by Osteopathic means, and something which are very dis-

tressing to the eye. We wet the finger with a little water or oil, sweet oil or vaseline, and press it under the edge of the lid, both above and below, and then pressing with the thumb against the outside of the lid upon the finger, work with the thumb and finger along the edge of the lid. In that way you stimulate the local blood-flow. The thickening causing the granulations is said to be due sometimes to a local hypertrophy of the conjunctiva, or sometimes to a stopping of the ducts of the meibomian glands. In thus working you would stimulate the blood-flow to make that conjunctiva normal, or you would take away the stoppage of the ducts of the glands. Sometimes the secretion gets thick and occludes the ducts. I have often heard Dr. Hildreth speak of quite a noted case of granulated eyelids which was entirely cured. He said that Dr. Still explained that there was a stoppage of the circulation, that the blood had to make some use of the nutriment which was carried there, and instead of it being directed normally it was directed abnormally on account of the stoppage, and so caused these abnormal growths. What he did was free the circulation. In any treatment of the eye we must work over the superior cervical ganglion to get our effect upon the circulation.

I spoke about points at which we can reach the fifth nerve. Particularly in work upon the eye we work at the supra-orbital notch or foramen, here at the junction of the inner and middle third of the arch. Be careful to free that so that any contraction of the tissues about it are thoroughly relaxed. Then the same thing should be done below, at the infra-orbital foramen. We also get a termination of the fifth nerve at the outer angle of the eye, and I always work carefully there and stimulate that branch of the fifth nerve. There is said to be a terminal branch just over the middle of the eye lid, and a terminal branch at the inner canthus of the eye, on the nose, where we can readily impinge upon it. A terminal branch is found also upon each side of the midline of the forehead. According to the theory that we can work upon nerve terminals, as we frequently do, to gain an important effect upon the connected parts, we here have a number of terminal branches of the fifth nerve which we could certainly influence in that way to restore the normal. At these places we also get the little blood vessels, here at the inner canthus and at the foramina, and free them in our treatment. Another way that is sometimes employed almost exclusively in work upon the eye is to have a patient spring the mouth open while you hold the jaw, the idea being to free the blood supply through the carotids, since the blood-supply of the eye is derived from the internal carotids, and it is a very important point in relation to work upon the eyes. We must not forget the point I mentioned in regard to the neck, and which you are familiar with, but the great and important point upon which we

work is the superior ganglion. Thoroughly relax everything and remove every pressure which may affect the blood flow. I showed you how to inhibit the action of the cervical sympathetic by holding. Stimulating would be the opposite—working quickly with alternate pressure and relaxation.

LECTURE XVIII.

At the last lecture I took up points in regard to the eye, giving you various centers, which I need not repeat here. Also I noted the importance of the ciliary ganglion in connection with the eye, the importance of the third nerve in relation with the eye; also of the fifth nerve in nutrition of the eye and parts of the head and face. Then I brought out certain points of importance to us as Osteopaths. I noted certain landmarks concerning the head and face; concluded the examination and took up the treatment of the eye. I wish to-day to continue our consideration of points about the head and face.

I. CERTAIN CENTERS FOR THE PARTS OF THE HEAD:
—I have already mentioned some in previous lectures. Howell's Text Book states that the cervical sympathetic contains vaso-constrictor fibres for the face, the eye, the ear, the salivary glands, the tongue, and perhaps the brain. As to vaso-motor nerves to the tongue; the lingual and glosso-pharyngeal nerves contain vaso-dilator fibres, while the hypoglossal and sympathetics contain vaso-constrictor fibres. The chorda tympani, as already noted, is the vaso-dilator of the submaxillary gland. Quain states that the secretory fibres of the submaxillary gland arise mainly from the second and third dorsal. Dana states that herpes, flushing, pallor, lachrymation and salivation indicate some disturbance of the sympathetic and trophic fibres contained in the fifth nerve. Quain states further that the glosso-pharyngeal nerve, through its small superficial petrosal branch, furnishes secretory and vaso-dilator fibres to the parotid gland.

*In view of these facts, and of facts which I have already presented, I wish to call the following points to your attention: First, that you have already been shown how to reach and treat the fifth nerve, the cervical sympathetic, the lingual, which is a branch of the facial, and the glossopharyngeal. I have brought up further the hypoglossal nerve, which is reached by the Osteopath indirectly by the treatment of the superior cervical sympathetic ganglion. The Osteopath thus controls the nerve-supply of all parts of the head practically, and through the

*See Appendix II.

nerve-supply the blood to the head, governing as he does, by his work upon the neck, the blood-flow to all parts of the head, he must have an important effect upon nutrition. A further point is that the Osteopathic work is very simple, and is made up largely of treatment in the neck, particularly at the superior cervical ganglion. I say very simple, because it is so in certain respects, but very complex when you come to study out the various complex relations of the nerves, and the effect we may get upon them by working upon centers.

II. LANDMARKS.—Holden instances the following points. The *opening* between the eyelids varies in size in different persons. It is this change, and not a variation in the size of the eyeball, which makes us say a person has a large or small eye, as the eyeballs are very nearly of the same size in different individuals. The *external angle* of the lid is generally a little higher than the internal angle, and gives an arch expression to the face. The closed lids fit accurately together, and are not beveled, as sometimes stated, to form a channel with the ball of the eye for the flow of the tears. Upon shutting the eye the ball turns slightly upward and inward, in that way cleansing the cornea of any foreign substance which may have dropped upon it, and also turning the pupil away from the light. The *puncta lachrymalia* are familiar to you; they are seen at the inner angle of each lid. The *lachrymal sac* is found by drawing the eyelids outward, tensing in that way the *tendo oculi*, which crosses the lachrymal sac about the middle. By placing your finger upon the *tendo oculi* you can feel, by winking the eye, that the orbicularis palpebrarum and the muscles about the eye, keep that tendon working so that the tears are pumped into the lachrymal sac and passed into the nasal duct. The *nasal duct* is from six to eight lines long, and passes from the lachrymal sac downward. It opens at the top of the inferior meatus or sometimes in the outer wall. The *left nostril*, you will see upon examination, is usually narrower than the right, owing to a deviation of the septum toward the left. It is important to know these points, so that you will recognize the normal conditions and not confuse them with disease. The middle and inferior *spongy bones* may be seen by dilating the nostril and throwing the head back. They are red in color and must be carefully distinguished from polypi.

The Osteopath should also note the *color of the lips*, the normal vermilion color indicating health, and a departure from this indicating either the state of the circulation or condition of the blood. In looking into the mouth always bear in mind to look at the condition of the *tongue*, as it is a great indicator of disease. Upon the under surface of the tongue is a *median furrow* upon each side of which is the *ranine vein*. In the middle line of the floor of the mouth is the *frenum linguae*, upon each side of which is the opening of the *duct of Wharton*, leading from the *submaxillary glands*, which you may find beneath the mucous membrane back near

the angle of the jaw. The *sub-lingual glands* are in the ridge of mucous membrane each side of the middle. The shape of the *hard palate* is sometimes significant, usually a broad arch. It is sometimes narrower at the top like a Gothic arch, and it is said that in idiots it is quite acute.

In examining the THROAT it is a good plan, it is said, to close the nostrils so that the person is obliged to breathe through the mouth. That will cause a dilation of the various parts of the throat, a widening of the fauces and a raising of the soft palate, so that you can then get a good view of the internal parts of the throat. When you depress the tongue it should be done gently with your finger or the handle of a spoon, or something of that kind. If you are rough, the tongue will resist the effort you are making to lower it. The operator can pass his finger down into the throat past the *epiglottis* as far as the inferior border of the *cricoid cartilage*; as far as the beginning of the oesophagus, and can make out the *greater cornua* of the hyoid bone and seek in the *hyoid spaces* on each side where any foreign body is quite apt to lodge. It is important to know that behind the last molar tooth there is a small *aperature* through which a little tube may be introduced through which to feed a patient in spasmodic closure of the lower jaw. The *pterygo-maxillary* ligament is seen opposite the last molar tooth. The place where the surgeon taps the antrum is just above the second bicuspid tooth, about an inch above the margin of the gum. The *aperature* of the *posterior nares* may be felt by passing the finger carefully up behind the soft palate, and there can be made out by the touch the back of the *septum* and the back of the *inferior spongy bone* in each nostril, also a grasping feeling from the action of the *superior constrictors* of the pharynx.

I have already spoken concerning the *tonsils*. They lie at the side of the throat, just behind the pillars, and in examination of the throat if you see them extending beyond those pillars, it shows they are abnormal in size. The normal tonsil does not extend beyond the pillars.

I have mentioned *physiognomy* in relation to examination of the face. It is stated that the insertion of the muscles, not only into tendons and bony parts of the face, but also into the skin all over the face, leads to the formation of lines. The passage of various thoughts through the mind constantly recurring, calls into play certain sets of muscles, and finally leaves lines upon the skin at the places of contraction, thus creating a reliable method by which the countenance may be read, and which is sometimes useful to us. There are two of these lines which I wish to mention particularly. First, there is the *linea nasalis*, extending from the *alæ nasi* out to the angle of the mouth. It is said that in children its presence denotes some abdominal trouble, especially inflammation of the bowels; in older persons some trouble with the stomach, or abdominal disease, frequently of the liver. The *linea labialis* extends from the angle

of the mouth down to the side of the jaw. It is seen frequently in children with inflammatory diseases of the larynx or lungs, and in older people who have laryngeal and bronchial trouble, and difficulty of breathing. Of course the Osteopath, as well as the physician, should become familiar with the indications of the face. They are interesting to study and are very practical in directing the operator's attention to the probabilities of disease—they are very helpful in diagnosis.

I wish to-day to examine further the parts of the head, and show you the treatment to be given.

III. EXAMINATION OF THE EAR. The disease may be in the external, in the internal, or in the middle ear, or it may be in the brain or in the auditory nerve itself. It is sometimes very difficult to say where the location of the disease is. First: As to examination of the *external auditory canal*, since it runs forward and inward and is slightly curved, you must draw the auricle upward and backward to be able to look down into the external canal. You must have a good light. You can look directly in without the aid of any instrument, but usually the operator should be supplied with an ear speculum, which is a little tube, funnel shaped, polished so as to reflect the light. Frequently a forehead mirror is used; a little mirror that is fastened by a band about the forehead, with an aperture in the middle, through which the operator may look. This reflects the light, and reveals the interior of the canal. In looking into the external ear you may notice that there is too much or too little *wax*, indicating some general disease. You may notice that there are *growths* in the ear, or *foreign bodies*, such as buttons in children's ears, or insects, or the wax may become hard and impacted. I had a case once in which a person had noticed a slight deafness, continually increasing until finally he was not able to hear his watch tick when held at his ear. I found by examination that the wax had become impacted. Of course he could hear internally by certain methods employed to test the hearing. I took the curved end of a hair pin and picked out the wax, and he could hear all right. It is quite a common thing in persons who have a poor quality of blood to have *furuncles*, or boils, in the external auditory canal. Your examination of the ear will reveal to you the *membrana tympani*, which should appear concave. It is in color a pearly gray and glistens with the reflection of the light. You can see the *processus brevis* of the malleus and the *manubrium* of the malleus, and you can, sometimes, with a good light, see the *processus longus* of the incus. The membrane appears concave, the most concave part is at the end of the manubrium, at the tip of the manubrium appears a bright triangle or pyramid of light where the reflection is brighter than at other parts, this cone of light is called the *umbo*. Only practice will make you familiar with the normal external parts and appearance of the membrane. Further, you should always in

examining the ear look for *perforations* of the membrane because those frequently occur in ear troubles.

As to the MIDDLE EAR, you may have it affected by different diseases, among which are inflammations, catarrh, etc., in which case pus or mucus may collect in it. In that case, the membrane would be pushed outward, and would be convex instead of concave. By examining from the external ear, if inflammation were present there would be a reddish appearance of the membrane. It is said the presence of mucus or pus gives a yellowish tinge to the membrane. For examination to see whether or not the *Eustachian tube* be closed there are different methods used. One is for the patient to close his nose and mouth and make an expiratory effort, eliciting a crackling sound of the membrane, due to the impact of the air. That is called Valsalva's method. Another method, called Politzer's, is practically the same. The patient is directed to swallow a little water, the operator having introduced a tube through one nostril, and closing the mouth and both nostrils except the tube; through this tube the operator blows, and the air is forced up toward the membrane, and in case the membrane is perforated there is a whistling sound as the air escapes, or if there is an accumulation of pus or fluids, they will be driven into the external ear. In case of closure of the external ear it is said that there is a *magnification of the sound* in the middle ear, or in case of closure of the Eustachian tube the same thing would obtain, or in case there was too much secretion about the ossicles, not allowing free motion. In such cases a tuning-fork held against the teeth causes the sound to be increased in the affected side. If it is heard louder in the other ear, it indicates some trouble with the internal ear of the affected side. Your diagnosis may be made still closer by placing a watch or tuning fork against the mastoid process of the affected ear; if there is no response you may be sure the trouble is in the internal ear. Those are a few methods by which you may determine where is the trouble that is affecting the ear. Since the aurist makes the ear his life time work, we cannot do justice to the subject in any one or two lectures.

*IV. TREATMENT OF THE EAR.—I have already shown you how to examine the external canal of the ear; the usual methods are employed to remove foreign substances, or in case of impacted wax you had better use some warm water; it may take several sittings to remove it entirely, and the hearing may be worse after the first treatment with the water because of the swelling of the wax filling the canal. In the case of insects in the ear, warm water or sweet oil may be introduced with a syringe. In ear affections there is usually trouble with the *atlas* or in the *upper cervical region*. We treat the lesion if we find it, in the neck, and

*See Appendix 12.

we treat the ear largely by regulating the blood supply; by springing the jaw, as already shown. The chief work in the neck is on the *superior cervical ganglion*, and in stimulating the blood-flow through the carotid arteries. In affections of the ear from catarrh or constitutional troubles you would have to direct your treatment to the general condition of the patient. I had an interesting case of deafness once, where I did not treat the ear at all. I found the clavicle was slipped; that the scaleni muscles were hard; that there was a paresis of the right arm. I slipped the clavicle back, treated the scaleni muscles, and the lady went up stairs and immediately called down that she could hear the clock ticking down stairs, something she had not done before. It must have been by sympathetic connection of the nerves which had been affected; the brachial plexus and the nerves to the ear. I do not know of any other way to account for it. That shows you cannot always work according to rule, but you must look for the cause and treat wherever that may occur.

EXAMINATION AND TREATMENT OF THE NOSE:—Since the aperture of the nostril is on a little lower level than the bottom of the passage of the nostril, you have to draw the nose up and back. You can dilate it with a speculum used for the purpose, and you can use either form of reflected light. You may see the *middle* and *inferior turbinated bones* and the marks I have mentioned. You will learn to recognize the normal conditions, and to note any diseased conditions and observe whether there are any growths in the nose; the *polypus* is the most common.

It is common to meet with fractured nasal bones. That belongs to the surgeon, but is very readily set. You can diagnose this condition by holding the ear close, and you can hear a grating sound as you move the nose. I have had cases in which I would straighten out the parts, using no splint or anything of that kind. With no splints the bones will stay in position and no deformity follow. You will sometimes notice that in catarrh, on account of the absorption of these turbinated bones, the nose is deflected to one side or to the other. The usual way in which we treat the nose, aside from the general system which is adopted in catarrh, the freeing of the blood-supply in the neck and of the blood-supply about the nose, is to work on the outside of the nose and loosen all the tissues along the side. In that way also you free the *nasal duct* by loosening all the tissues. Also, in case of stoppage of the nose in colds and catarrh, we place the hand flat above the frontal sinuses and press down quite hard. You can sometimes clear the nostrils in that way so that the stoppage is gone and the breathing is clear through the nostrils. There is another disease which you frequently meet, a ringing in the ear, *tinnitus aurium*. It is common in old people, and it is common also in constitutional diseases, after sunstroke, or in malnutrition, and old age. Therefore, it arises sometimes from conditions of general

health. The Osteopath has found that it is due, in some cases, to a stoppage of the circulation in the little anastomosis on the ear-drum, and he then works in the usual method to free the carotid artery, and by stretching the jaw. Sometimes the trouble is in an obstruction to the auditory nerve. It is said that we inhibit the auditory nerve by pressure in the neck opposite the third cervical, by steadily holding there.

I cannot mention, in such a lecture as this, all the points in connection with examination of the MOUTH AND THROAT. That also is a field for the specialist. I have noted that you should see the condition of the tongue, whether it is furred, what its temperature is, and its color. These are very indicative. For instance it is said a tongue furred on one side is indicative of a one-sided disease, as of the liver or spleen. A furred tongue has been noticed by Hilton in a case of ulceration of the teeth. The half of the tongue on the side of the mouth affected by the tooth was furred, and there was stiffness of the jaw. He referred it to the fifth nerve, which supplies the muscles of the jaw and supplies also a part of the tongue. As to the color of the tongue, we might mention, for instance, the strawberry tongue, as it is called, in scarlet fever, or the lead colored, thrush-covered tongue in the dying.

You will observe the TONSILS, the UVULA, and the condition of the FAUCES. Frequently in diseases of the throat the uvula is inflamed or edematous, and is hanging down, obstructing the passage of the air, and keeping the patient continually coughing. There are certain times when we give *internal treatment* to the mouth and throat, but not very frequently. That is, in case of catarrh, tonsilitis, or something of that kind. We insert the fingers, and by a pressure upward and outward along the pillars of the fauces, free the circulation to those parts, and in that way, to a considerable extent, allay the inflammation. That is, we frequently relax congested and contracted parts. The general treatment for the throat I have shown you, by loosening the muscles and by working to free the blood-supply, but you must also be sure that all the muscles throughout the neck are relaxed. You can feel those in the back of the neck, as I have already shown. You cannot, however, feel the anterior spinal muscles in the neck, you must take into consideration the probability that where others are contracted, they also are, and adapt your different motions to the stretching of those muscles; simply by stretching the head backward you can free all the branches of the nerves by relaxing the muscles.

There is a great deal more that might be said, both in general and in particular, concerning the eye, nose, throat, and parts of the head, but I think that in three lectures that I have given you I have been able to give you the usual Osteopathic treatment for the parts of the head, and to give a general idea of the importance of these things. Of course

we depend entirely upon the nerve and blood supply. That is the chief part of the work.

Q. In regard to examination of the nostril, you said we should observe the turbinated bones. Is there any way by which you can remove abnormal growths from that bone Osteopathically?

A. That bone is very frequently softened by catarrh, sometimes ulcerated and eaten away, and in so far as you can influence catarrh, with which we have good results, you could influence this other trouble, and by work upon the nose you might gradually restore the parts to their normal condition.

Q. You spoke of dropping of the uvula, is that not caused largely by catarrh?

A. Yes, sir, in general. Anything which would inflame, of which catarrh is an example.

LECTURE XIX.

At the eighteenth lecture I considered certain Osteopathic points about the head, giving you certain centers for the head and its parts, which I need not repeat here; something concerning the vaso-motors, that the Osteopath had therefore a good field upon which to work in treating the head and all its parts, the brain included. I then instanced certain landmarks, and took up further the subject of how to examine the parts of the head, including the eye, nose, throat and mouth. I wish to-day to call your attention further to the thorax and its parts. We have so far in our Osteopathic work seen how to examine the spine, neck, head, etc.; the significance of points discovered; also how to treat them. It is of great interest to us now to go to the THORAX. And in going to the thorax it is quite fitting that I should say something in particular about the *splanchnic nerves*. I have already said something concerning these nerves, but think something more in particular would be of value to you. The splanchnics are some of the most important tools with which the Osteopath works, and I will venture the assertion that there will be hardly a day in your practice pass without your working upon the splanchnics. They are of such far reaching connection that their importance at once becomes apparent, hence their constant use by the Osteopath. As to definition, you know what *splanchnology* is—the science of the viscera. Hence, the splanchnics refers to visceral nerves, those nerves governing the viscera, and it is in this fact that their significance lies. It is with the sympathetic splanchnic nerves that we as Osteopaths have to deal, and it is because of their far reaching control of visceral life and the wonderful results the Osteopath can get in working upon

them, that he has been so successful in treatment of diseases in general. That is one of the reasons, I should say.

Now, as to what these nerves are, we know at once that they are the sympathetics from the lateral chains of thoracic ganglia. I want to bring out a few points concerning these nerves by way of review, so that we will know what we are working with. First the *great splanchnic* arises from as high as the fifth or sixth, and from all of the thoracic ganglia below down to the ninth or tenth. It perforates the diaphragm and joins the lower part of the semi-lunar ganglion. In the chest it sometimes divides and forms a plexus with the smaller splanchnic. As to the nature of these fibres, they are white, medullated fibers. You remember in one of the first lectures I called your attention to the fact that in the sympathetic there are two kinds of fibers. It is stated by Quain that about four-fifths of the fibers of the splanchnics are made up of white, medullated fibers, and they come direct from the anterior roots of the spinal nerves. This greater splanchnic may arise as high as the third thoracic. Gray states it may receive branches from the upper six thoracic. This greater splanchnic gives branches to the aorta and to the front of the vertebræ.

The *smaller splanchnic* arises from the ninth and tenth, as usually described, sometimes from the tenth and eleventh, thoracic ganglia. Or, it may not arise from the ganglia, it may arise from the sympathetic cord itself without the intervention of ganglia. It also passes through the diaphragm, sometimes separately, sometimes in conjunction with the cord of the greater splanchnic. Like the greater splanchnic, it joins the lower part of the semi-lunar ganglion, and sends branches to the renal plexus in case the renal splanchnic is wanting, or is small.

The *smallest, or renal splanchnic*, as you gather from the above, is sometimes wanting. It arises from the last thoracic ganglion, and passes through the diaphragm in connection with the sympathetic cord, and goes to the renal plexus, not the semi-lunar ganglion.

A *fourth splanchnic* is sometimes described. It is stated that Wrisberg, in eight instances out of a great many, found a fourth splanchnic in the cervical region.

We all understand what is meant when we speak of the splanchnics. That is, these three splanchnic nerves. But you will see that it is sometimes used in a different sense. Gaskell, quoted by Quain, says that there are visceral branches from the second, third and fourth sacral nerves, and these he calls the "*sacral or pelvic splanchnics*." "*The cervico-cranial rami viscerales*" are visceral branches from the spinal accessory, pneumogastric, glosso-pharyngeal and facial nerves. So you see that visceral nerves have their origin from these cranial nerves; also a branch from the ciliary ganglion from the third nerve. Byron Robinson has

this to say concerning splanchnics in general: "There are certain fine white medullated nerves, which Gaskell mentioned, and which pass from the spinal cord in the white rami communicantes between the second dorsal and second lumbar nerves inclusively, to supply viscera and blood vessels. These nerves should be called, as Gaskell suggests, splanchnics. Hence, we will have, first, the thoracic splanchnics; second, the abdominal splanchnics, and third, the pelvic splanchnics." Hence, you will see the general use to which Gaskell put the term, in the use of which the other authorities have concurred. Robinson says further, that these white rami communicantes extend from the second dorsal to the second lumbar, but we know that along this region, and in the region above the second dorsal and below the second lumbar, gray ones are found. In the last two named regions, gray exclusively. That variety he calls peripheral, supplying the parities of the body. From the foregoing, and what has been said in general concerning splanchnics, we see that the splanchnics proper of which we speak, are white medullated fibers, for the most part, and that their particular function is to attend to the blood vessels and to the viscera.

Flint says that the splanchnics are the most important vaso-motors of the system. And further, Quain states that the medullated fibers, that is, such as we find in the splanchnics, which pass in the sympathetic system, are classed by Kolliker as; (a) *sensory*, (b) *vaso- and viscer-constrictors*, and (c) *vaso- and viscer-inhibitors*. Hence, we have passing from the spinal cord into the great prevertebral plexuses in the different regions these sensory, vaso-dilator and constrictor, and viscer-inhibitor and constrictor fibres. He goes on to say that the sensory are found only passing from the cranial nerves, but that the visceral and vaso-motor fibers are found all the way down the cord. Hence we see at once that these visceral and vaso-motor fibers are found in the splanchnics. In line with the above, Quain says further, that the splanchnic nerves proper act first, as viscer-inhibitory fibers for the stomach and intestines; second, as vaso-motor fibers to the abdominal blood vessels; third as afferent fibers from the abdominal viscera, that is, fibers from the abdominal viscera back to the center. That explains why it is that we get secondary lesions, as we call them. You may have some trouble in a viscus, and knowing that you have afferent fibers from the viscus to the center, you can account for the center being affected and the impulse coming out from it to the posterior spinal nerves. for example, and causing contracture of the muscles in the back.

I have already said enough to show you the importance of the splanchnics—to show you in general their nature and function. They become still more significant to the Osteopath when he considers their connections with the other parts of the sympathetic system. In the first

place, they must be connected with the spinal cord itself, since they arise from the anterior roots, and, through the cord, with the brain. It is doubtful how close a connection they have with the brain centers, but they have at least a close connection with the bulbar center, the vaso-constrictor center of the medulla. Then it is probable that these splanchnics have a close connection also with cardiac and pulmonary fibers arising from the upper part of the spinal cord, because we have seen that the center for the lungs extends from the second to the seventh dorsal, and that we work in the upper dorsal region for the heart, and there are certain vaso-motor fibers from these regions to the heart and lungs, so that it is almost indisputable that there is a connection between the splanchnics and what we might call other splanchnics for the heart and lungs. In the next place, we have seen that the first two splanchnic nerves join the semi-lunar ganglion, and the third the renal ganglion. And they are connected directly with the solar plexus, and through it with the other great prevertebral plexus, the hypogastric plexus, and through that with those secondary plexuses, such as the superior and inferior mesenteric, hemorrhoidal, portal, Auerbach's and Meissner's, and the various plexuses throughout the pelvis and elsewhere. Hence, anyone who sees the significance of Osteopathic work will see the significance of this far reaching connection with visceral and organic life. Then again, remember that in the thorax the first or greater splanchnic sends branches directly to the aorta itself. Hence it is that the operator so frequently works upon the splanchnics. It does not make any difference what kind of trouble you may have, the general health is likely to be affected, and it must be attended to; and whether you are working upon the stomach, liver, portal system, upon the intestines, or pelvic viscera, you will work, at least in part, upon the splanchnics.

There is a second sense in which we must consider the use of these splanchnic nerves, and we may state the matter this way; That WORK UPON THE SPLANCHNIC NERVES IS FREQUENTLY A REGULATIVE PROCESS. I might illustrate what I mean. Here you have a lot of sympathetic nerves, they are vaso-motor nerves for very important parts of the body, viz., the internal viscera, which receive an exceedingly large blood-supply. If the Osteopathic ability to work upon the nerve centers and nerve connections stands for anything, it must certainly stand for something when it goes to work upon these splanchnics. Hence, he must have a large control throughout a great portion of the circulation of the body, since it is so richly supplied from these nerves. Here you have a quantity of blood in the body; we will say in a certain case it is unequally divided. The Osteopath's work is sometimes to equalize the circulation throughout the body. In case you have a headache, which is frequently a congestion in the cranium, what do you wish to do? You wish to regulate the circu-

lation. You must therefore employ some regulative process, and very frequently we work upon these splanchnics to throw this congestion somewhere else where it will do no harm. Another thing, the most natural place for the overplus of blood to go is into the abdominal veins. Green makes the statement that the abdominal veins are the most easily dilated, and while I cannot exactly quote from him, I believe he goes on to say that the overplus of blood is most readily thrown there. At any rate I can state it is my experience that we can get important results by throwing the congested blood to the abdominal veins, and we do cause another congestion there. Not long ago I had a case of headache; it came from prolapsus uteri. The lady had vomited, and had had trouble with her stomach. I gave the usual treatments, as I always do first, working about the region of the stomach and liver, and over the splanchnics, as it looked as if the case at first might be a case of sick headache, later she told me it was from prolapsus. I then treated all about her head, but the headache did not go until I finally pressed deeply over the region of the solar plexus. By deep pressure there until you can feel the pulsation of the abdominal aorta, you will get important results. In other cases I have relieved headache by simply pressing there. Now, whether there was simply inhibition over the solar plexus, and thus to the brain, and thus quieting the painful senses, I could not say, but it seems to me more likely that it was a regulative process which inhibited the solar plexus and allowed the blood to come to the veins of the abdomen, and thus relieved the congestion in other parts. There is another thing that I frequently notice in my practice, that is, I get effects upon the circulation of the body by a general spinal treatment, which of course involves work upon the splanchnic region. And I can, by working there, coupled with the usual treatment I give the heart, get better results in quieting the pulse than I can by other methods. It seems to me it is because I get a dilation of the vessels throughout the abdominal viscera, hence lessening of the tension, slowing of the blood-flow follows, and a quieting of the pulse. A case of the same kind might be mentioned where a congested uterus was relieved by work over the splanchnic region. How we reach and treat that region I will show you in detail in the third part of the lecture.

In line with what I have stated, Howell's Text Book says that, "vascular changes produced reflexly in the splanchnic area are of especial importance because of the great number of vessels innervated through these nerves, and the great changes in blood pressure that can follow dilation or constriction on so large a scale." Some one asked me some time ago how we worked to cure a cold. I told him that was a matter of general treatment which I shall take up later. However, we give a spinal treatment, drawing the congestion from the part affected, which is

very frequently the head, and give relief. That is, we work upon a large amount of blood controlled by the splanchnics, and thus draw it away from the congested part. We thus see that it is a very probable, and, in view of the facts it is quite likely the case that the Osteopath can almost at will throw large quantities of blood to the abdominal region, or away from it, by proper treatment. I might state in passing that it is a principle of which we might take notice, that in a case of congestion it is a good plan to divert the congestion to some other part where it will do no harm. We stated the other day when the matter was brought up that the way to treat it was to sweep it out by freeing the arterial blood flow to the part. I am indebted to Dr. Conner for the suggestion that it is well to divert the congestion to a part where it will do no harm. I saw him treat a case some time ago, an old lady with a very troublesome cold in her head, which gave her headache and caused her a great deal of trouble. She had been treated for bronchial trouble, the pain had left the upper part of the chest, and she thought the congestion had been forced into the head. Several had treated the case unsuccessfully. Dr. Conner raised the clavicle and treated the circulation to the arm. I asked him about it. He said, "I just lifted that clavicle and sent the congestion down the arm where it would do no harm." I think we very frequently use that method and throw the blood somewhere else, but when it is thrown somewhere else I do not believe it is congestion. Howell's Text Book says further, "Anemia or asphyxia of the brain stimulates the cells composing the center, that is the vaso-motor center, and more blood enters the cranial cavity where it is needed. Doubtless the splanchnic area plays an important part in this restoration process." Hence we see from that, in the first place that the Osteopath may, by his appropriate methods, influence the blood in the splanchnic area by work upon the vaso-motor area in the medulla. And since it is a poor rule that will not work both ways, he can do the reverse, that is, he can affect blood-flow in the head by work upon the splanchnics directly. Our conclusions may be expressed under two heads, first, that in work upon the splanchnics the Osteopath works upon them for the effect that he produces upon the connected viscera supplied by those splanchnics. That he works upon them in a secondary manner, frequently, for regulation of blood currents to the body generally, or in some particular part of the body.

II. LANDMARKS:—(According to Holden:) Since the heart and lungs are contained in the thorax, and since abnormalities of the parts of the thorax may cause serious troubles with these important viscera, and since the Osteopath finds so many things upon which to work about the thorax, I hardly need to say to you that it is important that we know the landmarks of the thorax thoroughly. I have given you some in connection with the spine, but you will notice the following: As a rule the right side

of the chest is a *little larger* than the left, and you should bear that in mind in making your examination. In the female the *sternum* is shorter and the *upper ribs* are more movable. The *upper aperture* of the thorax is on a level with the second dorsal vertebra, is quite narrow, rarely exceeding two inches. Behind the first bone of the sternum there is no lung tissue. The left *vena innominata* crosses behind the sternum about an inch below the top. Next come the great primary branches from the aorta. You get, deeper in this region, the bifurcation of the trachea at about the level of the *junction of the first and second parts* of the sternum; and deepest of all lies the *oesophagus*. On the bifurcation of the trachea, and about an inch below the upper margin of the sternum, lies the highest part of the arch of the aorta, which curves over the left bronchus. The course of the *innominate artery* corresponds to a line drawn from the middle of the junction of the first and second bones of the sternum to the right sternoclavicular articulation. All these are interesting to know. Here is something that is absolutely essential to know.

RULES FOR COUNTING THE RIBS; In passing your fingers down the sternum in front you can readily detect where the first part ends and the second part begins. Here is the junction of the cartilage of the *second rib* with the sternum. The *first rib* is found by feeling behind the clavicle above, at about the junction of the middle and inner thirds. You can by deep pressure come to the first rib. The first and second ribs give a great deal of trouble, and it is important to keep in mind this rule to find them. In the male the nipple is usually between the *third and fourth ribs*, three quarters of an inch external to the line of their cartilages. It is said that the lower external border of the pectoralis major corresponds in direction with the *fifth rib*, that a horizontal line drawn from the nipple around the body will cut the *sixth intercostal space* at a point midway between the sternum and the spine. When the arm is raised the highest visible digitation of the serratus magnus corresponds with the *sixth rib*, and the *seventh* and *eighth* digitations correspond with the seventh and eighth ribs below. I have already noted that the scapula lies on the ribs from the second to the seventh inclusive. The *eleventh* and *twelfth* ribs are readily recognized, even in fleshy persons, at the outer edge of the erector spinæ, sloping downward. The sternal end of each rib is lower than the end which joins the spine, and it is said that if a horizontal line were drawn from the middle of the *third costal cartilage* at its junction with the sternum, it would touch the body of the *sixth dorsal vertebra*. The *end of the sternum* is upon a level with the tenth dorsal vertebra, its length varying some in different individuals, more in females than in males.

III. (a) HOW TO TREAT THE SPLANCHNICS. (b) HOW TO EXAMINE THE THORAX:—There are various ways in which we may treat the splanchnics. One of the best ways to treat them, espe-

cially the renal splanchnic, is to have the patient on the back, everything being relaxed. If you are afraid that the psoas muscles will not be relaxed, you can flex the limbs. Then, by reaching under, by thrusting in one hand from each side, and raising the patient on the tips of the fingers, we get one of the most important effects upon the splanchnics. Dr. Harry Still treats in that way almost entirely for the *kidneys*. We may also treat the splanchnics by having the patient on the side and springing the spine all along the region of the splanchnics. Also, one way is by loosening all of these muscles, or you might have the patient upon the face and work as I have already shown you, by working against the muscles, and this, restricted particularly to the splanchnic region, will stimulate the splanchnics. There is one more important way in which we reach the splanchnics, and it is something we apply usually to the treatment of the liver, which of course must be done directly over the splanchnics. In treating the liver I always end in this way, reaching over with the left hand I place it against the angles of the right ribs, bent at the metacarpo-phalangeal joints to make a fulcrum of the hand, the knuckles resting upon the table. Then, having hold of the arm of the patient just below the elbow, I push it up and back near the head, and then backward; that raises the ribs, and it gets an effect also upon the splanchnics directly; it will also act mechanically in freeing the ribs and giving the liver more space in which to work. Once more as to how we can reach the splanchnics in front. This is the motion I use just at the abdomen; deep pressure until you can feel the abdominal aorta. It is apt to hurt some patients quite a little. You will have to be very careful, some it will not hurt much, and if you do it gently and with quite a prolonged pressure, you can often get the most astonishing results. It is said also that this pressure treatment is very good to condense gas in the bloating of the abdomen.

As to the examination of the thorax, it is quite a long subject, and I will have to let some of it go over until the next lecture, but I might call your attention to the importance of making very careful examination of the thorax.

IN EXAMINING THE THORAX you should have the patient lying flat upon his back. First, remember that the right side is usually a little larger than the left. You should by inspection, next the skin if possible, see that both sides are about the same size—that one does not bulge more than the other. You will find important *changes in the shape* of the thorax. For instance, I saw a case of enlargement of the heart from cigarette smoking; there was a perceptible bulge in the precordial region. In another case, one of asthma I saw quite a bulge upon the right side in the region of the upper ribs. Also see that when the patient is standing the thorax is in shape; that is, that one side is not dropped more than the other.

Sometimes we will find one side of the thorax *dropped*. It is proper in making your examination, especially by palpation, to put both hands upon the corresponding parts, so that you involuntarily *compare* them. If I were examining this thorax upon the left side particularly, I would put my left hand upon the side opposite, so that I could compare the parts.

Of course, examine in front and behind. Then pass your hand over the surface of the skin to detect any departure from the normal *temperature*. I have already noted the importance of that in examination of the liver; in conditions resulting from diseased liver it is said that very frequently cold spots are found upon the surface of the body. However, you will have to be a little careful on a warm summer day, a person being in a state of perspiration, the skin will cool very rapidly.

You should observe the *shape of the thorax*—whether the general shape be normal. In an infant you will find it *cylindrical*. In asthma and emphysema you will find the characteristic *barrel-shaped chest*. In what is known as the paralytic chest, the antero-posterior diameter is lessened and the *chest is flattened*. I have mentioned that in cases of neurasthenia. The *rachitic* chest is flattened upon the sides. Also look closely at the *sternum*. It may be abnormally protruded or retracted, or there may be malposition at the junction of the first and second parts, and the ensiform appendix may be deflected to one side.

Finally, look at the *clavicle* and the *coracoid process*. You know where to find the coracoid, on the front of the shoulder at the origin of the coraco-brachialis muscle. It is easily found by exploring in the infra-clavicular space outward. Sometimes fibers of the deltoid get caught below it, sometimes fibers of the brachial plexus. The *clavicle* may be up or down at either extremity. You will acquaint yourself with the normal feeling here at the junction of the clavicle with the scapula and will readily detect when it has slipped up or down. You can also see if it has slipped down by seeing whether it is close to the coracoid process at the scapular end; you will recognize whether it corresponds with the normal. At the upper part of the sternum, the clavicle sets up quite prominently. It may slip down or be too high up, and you must learn to look for these things carefully.

LECTURE XX.

At the last lecture I considered especially the splanchnic nerves, showing you their origin, that they arise from as high as the third dorsal down to the twelfth; that they were composed, largely at least, of white medullated fibers, that they were closely connected with the cord, since they arise from the spinal nerves themselves, and with the various visceral

plexuses, also, which rule organic life; that they were extremely important in the work of the Osteopath, and that since the general health was so often involved in the troubles of the viscera, therefore he worked upon them very frequently; the fact that he worked usually directly for the benefit of the action he would get up on abdominal life, and that also he frequently worked in a regulative way, using the splanchnics for vaso-motor control, thus influencing large quantities of blood, drawing them from parts of the body where a congestion may have existed. I spoke in general also concerning congestion, and the way we treat it. I also brought out certain landmarks concerning the thorax and certain points in examination of the parts of the thorax. I wish to continue that subject to-day.

I. LANDMARKS OF THE THORAX:—The interval below the clavicle is the *sub-clavicular space*, between it and the upper margin of the pectoralis major below, and the deltoid externally, and is important as a guide to us to find the *coracoid process*. By drawing the arm up and backward, in this way tensing those muscles, we can find the sub-clavicular space, and at the outer part near the shoulder, we can find the inner side of the coracoid process. Also that space corresponds in direction to the direction of the *axillary artery*; we can feel it pulsing there, and can compress it against the second rib. The *internal mammary artery* runs perpendicularly to the cartilages of the ribs, and about half an inch external to the margin of the sternum. Its perforating branch at the second intercostal space is the chief one.

It becomes important for Osteopaths in examination of the *heart* to know just what its *topography* upon the chest wall would be. The following description of the outline of the heart on the chest wall is given:

The *BASE* corresponds to a horizontal line drawn from the third costal cartilages, their upper border, extended a half inch to the right and an inch to the left of the sternum; the *APEX* is found by measuring one inch internal and two inches below the nipple, this point being between the fifth and sixth ribs; the *LOWER MARGIN* may be outlined by drawing a line from this point of the apex, bulging slightly downward to the end of the sternum, the xiphoid cartilage excepted, that line extended as far as the right edge of the sternum; the *RIGHT BORDER* would therefore be indicated by a line joining a point at the right inferior extremity of the sternum with a point on a level with the cartilages of the third rib, extended half an inch to the right, while on the *LEFT THE BORDER* would be indicated by a line drawn from the left extremity of this line at the base, an inch from the sternum on the level with the third costal cartilage, down to the point which indicates the apex. In that way you would get the outline of the heart upon the chest wall. It is said that a needle passed into the third, fourth and fifth intercostal spaces on the right side just next

to the sternum, would perforate the lung, pericardium, and the right auricle. A needle passed into the second interspace would perforate the aorta at its greatest bulge, also the part of the pericardium which is reflected over the first part of the aorta. And that a needle perforating the first intercostal space on the right of the sternum would enter the superior vena cava.

This rule is given for finding the extent, or outlining in general the *dull-sounding space* in the precardial region made by the presence of the heart; take a point midway between the nipple and the lower end of the sternum, xiphoid excepted, a point midway for your center, and describe about that a circle with a radius of two inches, and that will include practically all of this dull-sounding region over the heart.

The *apex* of the heart, as you know, beats between the fifth and sixth ribs. Its impulse is readily felt there, but that is not an invariable place to find it. You can change the position of the heart by changing your position. You may cause the heart to deviate from its usual locus by turning from side to side. In deep inspiration the heart may descend somewhat, so that when you have taken a deep breath you may feel the beating of the heart over the pit of the stomach.

As to the VALVES OF THE HEART and their location externally: The *aortic* valves are located behind the third intercostal space close to the left border of the sternum; the *pulmonary* valves at the junction of the third costal cartilage with the sternum, on the left; the *tricuspid* valves are on a level with the cartilage of the fourth rib just behind the middle of the sternum, and the *mitral* valves are at the third intercostal space, about an inch to the left of the sternum. Since the valves are close together they are readily covered by the tip of the stethoscope or by the ear. And since they are covered by a small amount of lung tissue you can hear the heart better by having the patient hold the breath while you listen to the beating of the heart. For the reason that these valves are so close together it is better in trying to distinguish the sounds from each other, to go out a little way in the *direction of the current* from the valve. Thus, in sounding the aortic valves, you would go to the *second intercostal space*, just at the *right* edge of the sternum. For sounding the pulmonary valves, you would go to the *second intercostal space* at the *left* edge of the sternum. To sound the tricuspid valves you would take the point at the *end of the sternum* just behind the middle, and to observe the sound of the mitral valves you would listen at the *apex of the heart*. That is according to the direction that the blood currents take.

For finding the OUTLINE OF THE LUNGS upon the chest wall: You know that they rise *above the clavicle* an inch and a half, or in some cases two inches; that there is very little lung tissue behind the *first part of the sternum*; from the claviculo-sternal articulation down to about the second

rib, the *anterior edges* of the lungs converge. From the second to the fourth they are *close together* in the median line, quite close, also about *parallel*. Below this point their course on the different sides is different. On the *right* side it follows down along the *course of the sixth costal cartilage*. On the *left* it is notched for the heart, *descending back of the heart*. On the *left* side it descends as far as the lower border of the *fourth* rib, which it follows. It reaches a line drawn perpendicularly from the nipple, at the lower edge of the *sixth* rib. In the axillary region on each side it is found at the *lower edge of the eighth* rib, and behind, extends as far down as the tenth rib. Of course in the deep inspiration it descends still lower.

II. EXAMINATION OF THE THORAX.—(*Continued.*)—I began to take up this examination at the last meeting. I wish first to give you some points concerning the divisions of the thorax, which I thought best to describe to you for the sake of your understanding them when you meet them in your reading, so that you will know what is meant by the mammary region, the scalpular region, etc. This division is the one adopted by Loomis. He divides the chest first into THREE GENERAL REGIONS, the anterior, lateral and posterior. The area on the ANTERIOR aspect is again divided: The *supra-clavicular* portion is that just above the clavicle. The *clavicular* portion is that corresponding to the inner three-fifths of the clavicle, and is bounded by that bone. The *infra-clavicular space* extends from the lower border of the third rib; internally it is bounded by the edge of the sternum, and externally by a perpendicular line dropped from the junction of the middle and outer third of the clavicle. Next below comes the *mammary region*, extending from the lower border of the third rib to the lower border of the sixth rib, extending inward as far as the edge of the sternum, and outward as far as the last described. Next, as for the *sternal region*: There is the *suprasternal* region, which he describes as the region just above the sternum. The *superior sternal* region is that portion behind as much of the sternum as lies above the inferior border of the third rib and the *inferior sternal* region, that behind the rest of the sternum.

On the POSTERIOR aspect we have three regions: The *supra-scapular* and *scapular*, corresponding to the space from the second to the seventh ribs inclusive, and corresponding respectively to the supra-spinatus and infra-spinatus fossæ of the scapula, extending inward in this region as far as the axillary region. The *infra-scapular* region extends from the lower angle of the scapula and the seventh dorsal vertebra down to the lower margin of the twelfth rib; extending internally in this case to the spines of the vertebræ, and externally to the inferior axillary region. There is also an *interscapular* region, one on each side corresponding to the space between the second and sixth ribs, and between the inner or spinal edge of the scapula and the spines of the dorsal vertebræ. Speaking, by the

way, of listening to the sound of the aorta, it is also heard in the region of the back from the third down to the ninth dorsal vertebra.

Laterally we have the *axillary* space, bounded above by the axilla, and below by a line projected from the mammary space, that is, from the inferior border of the third rib. Then we have the *infra-axillary* space extending from the axillary space above down to the lower margin of the 12th rib; bounded in front by the infra-mammary region and posteriorly by the infra scapular region.

You know already, as far as practical for our work, the contents of these different regions, especially when studied in conjunction with the points I have already given you in these landmarks. As I said, I give these general regions to you, not to detail the parts found in them, but so that you will understand, when an author speaks of these general regions, what he is speaking of. You are of course aware that in making a physical diagnosis, of which our method largely consists, we use *auscultation*, *inspection*, *percussion*, *palpation* and *mensuration*. In our examination we want to hear and see all that we can that is going on about the human body, especially in the way of examining and making out things which have caused a departure from the normal. I mentioned certain points at the last lecture in relation to the chest.

There is another point that I wish to speak of which is important in our practice, and that is the *movement* of the chest, as to whether the two sides correspond; whether one side is restricted in movement, as in the case of pneumonia, or whether the inferior ribs are drawn in, as in most cases of asthma, where I have seen them drawn in extensively. Also note whether or not the action of the opposite side is normal or increased to compensate for lack of normal on the other side. It is taken as a very good sign of tuberculosis if there is a *depression* in the infra-clavicular region. A great deal more might be said about these different methods of physical diagnosis, but it is hardly the place here to go into them extensively. In considering *palpation*, that is the examination on the surface with the hand, I brought up certain points last time. We should not only touch both sides of the thorax in making the examination, but we should touch with equal force, touch in the corresponding place each time, and you need not lay your hand on heavily, lightly is sufficient.

Auscultation and *percussion* are by far the most important methods in dealing with the chest, especially since it contains the heart and lungs, and to get a good idea how the heart and lungs are behaving we must listen to them directly and also listen to them by percussing the region in which they lie. The authors have different methods of bringing out these points. I have been reading Loomis and he has very good points. They all make this statement, that percussion is either immediate or mediate.

Immediate percussion, or direct tapping upon the part, is the old method and is very little used nowadays. The *mediate* style is the one used most, in which you use a little rubber tipped hammer as you percuss, and what is known as a pleximeter placed between the hammer and the part sounded. This is very rarely used. It is stated by some authors that we have as good instruments as necessary, the middle or index finger of the left hand being the pleximeter, and the fingers of the right hand being the hammer. There are certain simple rules that we may adopt in using this method of physical diagnosis. First, it will be of little value to you to find a difference in sound unless both sides of the chest, or of the part of the body which is being examined, are similarly disposed, so that one is not in a higher plane than the other. You must be extremely careful of the *position* of the patient. Then, also, you should have the parts slightly *tensed*. For instance, in examining the chest the arms should drop downward and the head be thrown back. If you are percussing the axillary region, have the arms lifted. If you are percussing the back, have the patient stoop over slightly so as to bring tension on the part percussed. That should be done evenly; a patient should not have one arm down and the other over the head. The condition on each side should be *similar*. It is well to make the examination directly upon the skin, or if that is not practicable, make it upon some thin, soft cloth spread over the chest, of such a nature that it will not interfere with the sound. You should, of course, *percuss equally* on each side, and in case of the lungs you should take it at the *same stage* of respiration, that is, you should not tap on one side while the patient is inhaling and on the other side while the patient is exhaling. You should have an *equal pressure* with the pleximeter finger, and an equal forcibleness of the striking hand, because you can make the sound different by striking harder on one side or by holding the hand more loosely against the surface you are examining. The best percussing motion comes from the wrist and not from the whole arm, and in general tap lightly for an examination of the superficial parts and more forcibly for parts more deeply located.

In the practice of *auscultation* the same general rules will apply. You have the *immediate* in which you apply the ear directly to the part, or you have the *mediate* in which you use some instrument, as a stethoscope. The authors differ a great deal as to whether a stethoscope should be used. Loomis is particular that it should be used in examining the heart, but does not care much for it in examining the lungs. Raue says he prefers in all cases the use of the ear alone unless considerations of cleanliness make it convenient for the use of the stethoscope. If you are examining the chest and it is covered, see that the covering is a thin soft cloth, a towel will usually do; something that will not interfere with the sound. See that your patient is in a proper condition, with both parts disposed

alike, and give your full attention to the sound itself. The ear should be evenly applied in each case alike, not forcibly but firmly. You should listen to the corresponding parts, and in touching you should touch over the corresponding parts, for instance it would not do to tap over a rib on one side and over the interspace on the other. You must examine the corresponding parts, no matter how you do it, and especially in respiration it is better to examine under conditions as nearly normal as possible; have the patient breathing quietly and in a natural way.

I mention these things to you more for the sake of a hint of what there is in the subject and what there is for you to study, since it is quite a complex matter to go in detail over the different sounds that you will hear, and to do so would probably confuse you more than elucidate the subject. Also it is very difficult to show these things without clinic material, and you can only learn them by practice. You should become perfectly familiar with the sound of the normal parts, both on auscultation and percussion, and then you will note any departure from the normal when you come to make examinations, and also to distinguish the different abnormal sounds one from another. I would advise you to become familiar with the instruments that you are going to use. Get familiar with the sounds by the ear if you are going to use the ear, or familiar with a certain stethoscope, as the sounds vary with different instruments.

III. HOW TO EXAMINE FOR DISPLACED RIBS. I examined the different parts of the thorax at the last time. In the first place, I need hardly to remind you that in variations in the spine, any abnormal curve in the spine, either CURVATURE or departure from the normal curves, will tend to alter the normal position of the ribs. In examining the spine, if you find that the parts are not in normal position, you will at once look for dislocations or luxations in the ribs corresponding with the affected part in the spine. You may find a *general alternation* in the shape of the chest, as for instance the flattening in the paralytic chest in its anter-posterior diameter; or flattening in the lateral diameter in rachitis, or bulging or barrel-shaped chest in asthma or emphysema. You will then see at once that there is a change not only in the thorax in general but in its parts necessarily, and you will probably find that the ribs are misplaced. To examine and replace subluxated or displaced ribs is one of the most important parts of our practice, not only because it occurs so frequently, but because it is very troublesome. They often cause serious trouble and are hard to locate in some instances, they will require your very careful attention. †

We might explain why it is that ribs when displaced cause so much trouble. I think the theory already advanced will explain that as far as it goes, that is, parts out of the normal, whether they be ribs or

vertebræ, will bring pressure in some cases upon structures such as nerves and blood-vessels; in other cases they would drag ligaments across important structures. In other cases they may result in contractures and that will be followed by other results already noted. So in examining a spine and the chest particularly you should examine each rib. I have already given you the rules for counting the ribs, and having found where each rib is you should examine each rib in particular. It is said where a rib is displaced you will very likely find tender points along its course. Dr. McConnell says that usually there is a tender point at the spine where it is displaced, another about the middle region, and another at the anterior end. You will also find cases where they are sore almost all the way along, especially the anterior half.*

The ribs may be pressed *together behind and separated in front*. In general you will look for the soreness over the rib and over the part of the interspace which is narrowed. I have found that to be so in my experience. The displaced rib may be separated from one rib, which naturally causes it to be approximated to some other rib, and you will judge which it is by finding the widening above and the narrowing below, for any one rib or any group of ribs. Then your rib may be changed, not being slipped up or down, but may be *twisted* so that you will find the edge more prominent, and in this case it is very common to find the under edge the most prominent. The best method that I have found in examination is to use the tips of the fingers and follow down the course of the intercostal spaces. You can then learn, knowing the normal, whether or not these parts are too much separated or too close together; you will also note whether or not they are not twisted.

Sometimes the *cartilages* will be distorted, and in that case you will find an irregularity and a tenderness along them. They may be twisted or may have been torn and grown together. I have seen several cases in which the cartilage had been broken away from the tenth rib, and the person had three floaters on each side instead of two. It is said to be a fact that there is a little weaker attachment of the cartilages to the ends of the ribs in the case of the tenth than in the case of the other ribs. In examining the ribs of the patient what I have said will apply to all of the ribs, but of course we must apply our examination to all parts of the thorax, anterior and posterior. But in examining the *first and second ribs* you will find that something more of a consideration. The first and second ribs, on account of their attachment to the scaleni muscles; are usually displaced upward, because the tendency of these muscles when contracted is to draw the ribs upward. In the first place,

*See Appendix, 13.

how would you tell whether or not this first rib is up? To find it you feel down about the middle point of the clavicle, press down and back and you will immediately come to the first rib. You must first know that the clavicle itself is in position. If its acromial and clavicular ends are both *in situ*, then you can judge from the relative position of the first rib whether it is up or down. Of course the more it is slipped up, the more it tends to come on the level with the upper edge of the clavicle, or if it is down it will widen the space between them. That is one of the best ways of determining by examination whether it be up or down. The second rib is somewhat more difficult to get at.* You can feel it, as I noted, in the outer portion of this infra clavicular space by drawing the arm outward and down, tensing the muscle. You can also examine it by finding the junction of the first and second parts of the sternum; follow the cartilage out, you can feel it as far as the clavicle. Note whether the points are sore at the places where you can reach the rib; and by following further there will be a difference in the intercostal space, and you can tell whether the second rib is up or down, but it will require practice and I will promise you that the first and second ribs are very hard to deal with. Just as the first two ribs are usually up, the *last two* by some strange compensation of nature, go down. As the man said, "There is compensation in everything; snow comes down in winter and ice goes up in summer." The reason why these *last two* ribs go down, especially the last one, is that the quadratus lumborum muscle is attached to it, and it seems to be the nature of the eleventh to follow the twelfth in its course downward, I do not know just why, unless it is because it is not attached by a cartilage to the others above, and is free to follow the other. The position of these ribs is very readily ascertained even in a fleshy person. It will take considerable dexterity of touch to accustom you to find them, but by patience you can do it. Any of these ribs may not only be slipped up or down, but one may overlap another. I saw a case the other day in which the tenth was overlapping the eleventh quite prominently. Then, you may find that these last two floating ribs instead of being down may be up, and the twelfth may be pushed up under the eleventh. In that case they often cause trouble, but they may sometimes be down without any trouble at all, in which case it will not be necessary for you to bother with them. !

I wish to tell you *how to set the clavicle*. I noted it in the examination the last time. Suppose, in the first place, it is down. It may be *down* at either end. I believe the commonest place for it to be down is at the outer end, because of the attachment of the deltoid and of the pectoralis major to it at the outer end. The way Doctor Still told me to

*See Appendix, 14.

treat that is to place the fingers against the anterior edge of the clavicle near the sternal end, draw the arm then inward, across the chest, thus relaxing the ligaments and the muscles. Then push upward upon the first point that I noted, the anterior edge of the clavicle, push upward, and draw the arm up backward. Thus having relaxed the ligaments and muscles, your push will serve, on account of the peculiar shape of the clavicle, to push it in to its proper articulation. In case it is slipped *up* at the acromial articulation, that sometimes happens and causes a catching of the fibers of the deltoid, or it impinges on the fibers of the brachial plexus; the best way is to raise the arm to relax all muscular tension, since it is bound to the shoulder here by the deltoid partly, and some of these smaller muscles; relax them in that way, then you can place your fingers in behind the part that is slipped up, and it does not make much difference which way you throw the arm. Dr. Harry Still says when a joint is out almost any way you turn it, it will want to go back where it belongs, which of course is true, that is the tendency toward the normal.

In case it is *down at the sternal end*, which you find with a fair degree of frequency, one of the best ways is to thrust the thumb of one hand under behind the sternal end of the clavicle, thrust it in deeply, and relax the muscles by drawing the arm up and inward. Then by drawing the arm over, down and out and thus tensing the muscles, it brings a leverage upon that end of the clavicle, and will force it up. Or, you do practically the same thing by bringing the arm up and around and making a twist in such a way as to tense the muscles. In other words, this is just a system of animal mechanics whereby you study out the shape of the bones, their attachments and ligaments, attachment of the muscles, and just how to use these ligaments, bones and muscles as levers and pulleys, so as to work them back into place. Now, if the *clavicle is up at the sternal end*, the point would be to relax again and force it down from above by working with the thumb in behind it. Another good way to free the space between the clavicle and the first rib is to thrust the fingers in behind the clavicle where it is always tender, and draw the arm up over the face and then on out, thus getting a very good leverage.

LECTURE XXI.

At the last lecture I took up certain landmarks of the thorax, showing you, among other things, what was the outline of the heart upon the chest wall; where to note its valves, and where to listen to the sounds produced by their action; that the point at which you should listen varies

from the position of the valve in the direction of the current of blood. Also I noted the topography of the lung upon the chest wall. Then I took up certain points in the examination of the thorax, showing you how it was divided into the different regions; then spoke concerning auscultation, palpation, mensuration, percussion, etc., the different methods that we use. Then I brought up to the point of how to examine for displaced ribs. To-day I wish to take up more particularly the contents of the thorax, viz., the heart and lungs. They are, of course, important to the Osteopath, and since they have so much to do with life, they must be carefully looked after. I think that the Osteopath has more success than other forms of healing with troubles in the heart and lungs. A great many troubles of the heart are not organic, and when not organic the opportunities for Osteopathic work are much better than when organic.

I. SOME CENTERS AND NERVE CONNECTIONS FOR THE HEART AND LUNGS: There are certain facts that we meet in our Osteopathic work which lead us to reason about nerve action. In the first place, displaced ribs will very readily affect the heart. Sympathetic troubles, such as crying and the like, are caused by contractures along the left side of the back between the shoulders, or by displacements in that region, displacements of the third, fourth and fifth ribs particularly. From the fact that we can reach the heart through the superior cervical ganglion and in the upper dorsal region, on the left side, and from the fact that there are certain centers given, as that in the medulla, and for the rhythm of the heart in the cervical region, at the third and fourth, we naturally wish to know what is the nerve connection, and why it is that working there we can get such an important effect upon the heart. That we do get these effects, of course our practice shows. It is simply a question of fitting theories to these facts. In the first place, we sometimes work along the splanchnics, and thus get an effect upon the centers, which I explained at length in the lecture the other day. Then there is our work in the upper dorsal region. Those are the two places, except the neck, where we get the most important effects. Now, as to this nerve connection between the heart and the spine, Jacobson brings out the connection here very admirably, in relation to infra-mammary pains. He shows how the viscera are connected through the sympathetics, the great splanchnic particularly, connected with the spine as high as the fourth, fifth and sixth spinal nerves. We have learned that the great splanchnic may arise as high as the third also. These spinal nerves send certain sympathetic branches to the aorta; from the fourth, fifth and sixth sympathetic ganglia branches are given off which form a plexus about the aorta. This plexus over the aorta gives branches to the cardiac plexus about the heart. Further, there are branches given off from the

fourth, fifth and sixth, cutaneous branches, descending over the ribs and supplying parts along the sixth, seventh and eighth ribs. Hence you have a direct connection between the pain which you feel by means of these cutaneous nerves of the sixth, seventh and eighth interspace which run in their distribution beneath the breast, in the infra-mammary region, a connection with the spinal nerves, and thus with the fourth, fifth and sixth spinal nerves, and through them out to the sympathetic plexuses about the aorta and the heart. Thus, you have an indirect connection between the cutaneous pain on the one hand, and the heart on the other. You may have pains in the infra-mammary region caused by diseases of the heart. Hilton also states something concerning the sympathetic pains which we may feel on the surface of the body. Pains from diseased viscera, the liver or intestines, for instance, are often reflected to the region between the shoulders or at the inferior angles of the scapula. You can readily see how this connection takes place, between the sympathetics from the great splanchnics and the spinal nerves, directed to the region of the scapulæ and the region between them and about their angles. Thus we see how we may have pain in a distant part of the body when a certain terminal is affected. I have, myself, noticed in certain cases of trouble with the liver, where the liver was tender, that I could, by pressure, cause a pain under the scapula, especially on the left side.

Taking into consideration the connection between the heart and this upper dorsal region, the fourth, fifth and sixth, you can see how the Osteopath, by working there, where he does very frequently to affect the heart, can get an effect upon the heart, and thus upon the general circulation. I think I instanced the point that by working along the splanchnics, and by working along the upper dorsal region, I could get important effects in quieting the heart. I have sometimes quieted the heart as much as from ten to twenty beats per minute, when it was running high, by work in this region. Thus you will see that work here upon the heart is directly upon nerve action, but we must not omit to notice the fact that by raising the ribs we get a mechanical effect, if those ribs were so lowered as to narrow the cavity in which the heart acts. Any lessening of that cavity has a tendency to interfere with the heart's beat, so that by mechanically enlarging the cavity we also get an effect upon the heart. It is probable also that the raising of the ribs frees pressure upon nerve connections along the spine.

Further, as to connections in the upper dorsal region between the nerves and the heart, Quain says that accelerator fibres of the heart, derived from the upper four or five dorsal nerves, but chiefly from the second and third, are sometimes found. The spinal fibres end and sympathetic fibres begin in the middle and lower cervical, perhaps also in

the first thoracic ganglion. That is, these fibres really come from the sympathetics, the change of fibres occurring in the ganglia mentioned.

He says further, that vaso-constrictor fibres of pulmonary vessels have been found in the dog from the second to the seventh spinal nerves, and they connect in the stellate ganglion. In the dog and the cat it is said that the lower cervical and upper thoracic ganglia are connected to form what is called the stellate ganglion. While it has not been demonstrated in man that these fibres arise from the second to the seventh, these vaso-constrictors for the pulmonary vessels, it looks probable that there are some such fibres existing, since that is the identical center upon which we work to affect the lungs; the second to the seventh dorsal.

Howell's Text Book states that stimulation of the vagus in the neck constricts the pulmonary vessels, while stimulation of the sympathetics of the neck will dilate the pulmonary vessels; also that there is noted a reflex contraction of the pulmonary vessels by stimulation of some other nerve, as for instance, the sciatic, intercostal nerves, abdominal pneumogastric, or abdominal sympathetics. This will call to your mind what I have said concerning regulative processes, in our work upon different parts of the body. I mentioned that particularly in relation to the splanchnics; you see the reflex effect gained by stimulation of these nerves in different parts of the body and its effect upon the lungs. You see how general that work may become.

It is an interesting fact to note what Robinson says concerning the heart and the aorta, which are the foundation of the circulatory system. He says that they have been noted at times to have periods of violent, rapid beating, and that the heart itself and the aorta appears to be dilated and to be working very forcibly; that feeling of the pulse in other parts of the body would not indicate that the effect was general. Robinson says that this has been little made of in books, in fact, he does not know that it is mentioned except something about the aorta, and explains it by influence of one kind or another which may affect the various local sympathetic centers. And of the aorta he says he has seen it, in case of a thin woman, beating violently and simulating in every respect an aneurism. He explains it by saying that the centers in the substance or in the immediate neighborhood of the aorta are in some way affected, though the effect may, of course, be dependent upon general conditions.

II. EXAMINATION OF THE HEART.—First, some general points as to the heart. Doctor Still explains some of his recent illness by a stoppage of the aorta at the point where it perforates the diaphragm. He says that frequently some injury there may cause a constriction, if the injury be of such a kind as to allow a relaxation of the vault of the diaphragm, causing a constriction about the point where the aorta passes through, and thus restricting the blood-flow. Thus, he says, the heart

goes to pounding to force the blood through, and the result is palpitation of the heart. That is similar to effects we have in other parts of the body, where a thickening of parts about an important structure would lead to troubles which were of peculiar significance to the Osteopath. So Doctor Still wears a belt. He says that compresses the lower part of the thorax and allows the diaphragm to bulge upward.

Second, as to your examination. You must take into consideration that the heart, being so closely connected with sympathetic life in every part of the body, is affected by general sympathetic disturbances. You may have trouble almost anywhere, in the neck or with the genital organs; or you get an important effect upon the heart and circulation by dilation of the rectal sphincters. Such a slight cause as a dropping of the acromial end of the clavicle, or either end of the clavicle, shutting down upon the circulation through the subclavian artery and vein, generally the vein, has caused angina pectoris. I knew of a very bad case where the patient was ready to die of heart trouble and looked about as bad as a person could look. She was cured by Doctor Still setting the clavicle. It was a typical case, with the radiating pains over the chest and all the accompanying symptoms. That lady is one of our graduates now and enjoying a lucrative practice. Also the same kind of a slip may cause a periodic emptying of the innominate vein, and thus lead to a loss of a beat of the heart occasionally, so that the heart will be beating irregularly. So consider that in looking for trouble with the heart, you will need to examine not only the region of the thorax, but everything that might affect the vessels coming from it. Do not forget that the clavicle or the first and second ribs are apt to cause troubles of the heart. The reason seems to be that since they are usually displaced upward, they bring pressure upon some of the blood vessels, or interfere at the spine with some of the important nerves which I mentioned in the previous part of my lecture.

I do not know but that it should be as much a matter of pride with us to observe a professional demeanor in our calling upon a patient, as it is with our medical friends. I have gone with a student to see a patient where there was trouble of the heart—I remember one case particularly, a case of asthma. I felt the pulse the first thing, as I usually do; the heart was beating at the rate of 120 per minute, but the student had not noticed it, although having treated the case several times. Always note the pulse. It is, of course, an important clue to the state of the circulation. It will tell you whether or not the heart is intermitting, whether or not the heart is beating too strongly or too weakly; whether or not the pulse is normal in every respect. The strength of the beat you can tell, then, and the frequency and the regularity. So I first take the pulse, which is usually found best at the left wrist at the radial artery. Also note

the chest, the shape of it. In enlargement of the heart there may be a bulging in the precordial region. Or narrowing of the chest may interfere with the heart. Do not forget inspection of the chest in examination for troubles of the heart. Note also by inspection and by palpation whether the apex beat is normal, occurring at the interspace between the fifth and sixth ribs. You can, by knowing how it beats normally, tell when it has departed from the normal, whether it beat too strongly or weakly. Or it may be displaced to one side or the other by troubles of the other viscera, the lungs, for instance. By palpation, not only at the apex but over the region of the heart, preferably with the patient sitting up, you can note the three points that you want, that is, regularity, frequency and strength of beat. In examining for enlargement or encroachment of other solid viscera upon the heart, use percussion. It is as well to percuss next to the skin, or through some soft thin cloth. The best way to make a pleximeter of your left hand is by laying, not the whole palm of your hand, but just the middle finger upon the surface to be percussed, and then striking it with the tips of the fingers of the right hand brought in line, or by the index finger. When you come to the heart you note its flat sound. I noted to you the other day how to find that region, a circle drawn with a radius of two inches about a point midway between the nipple and the end of the sternum.

In making percussion over the parts of the lungs which are most liable to be affected in tuberculosis, make it light, because there is some danger of starting a fresh hemorrhage if you use forcible percussion. Light percussion is as effective as is forcible. Of course this flat sound of the heart may vary, as for instance in emphysema it may become resonant. Or it may be increased by some effusion in the pericardium, or some effusion in the pleura or some enlargement of the stomach upward, or by solidification of the lung, anything that will make a larger area of the flat sound in the region of the heart. By studying these things they will be an important aid to your diagnosis.

We also practice auscultation upon the heart, by placing the ear over the region of the heart. This is the best method of examining it. You will need to note the sounds of the heart particularly, and for doing that you would have to know the sounds for the various valves. Of course there are various murmurs, regurgitant, restrictive, etc. There are murmurs that occur in several conditions of the heart. Sometimes there is a venous murmur, as in the jugular vein. It is said that by holding the vein, and compressing it for a few minutes you can stop that hum. To differentiate between it and the heart murmur, particularly that caused by friction of the heart against the pericardium when it has been thickened by some inflammatory process, is difficult. It is also difficult to differentiate from other murmurs in the heart, and the

only way is to find that this sound follows, while the other accompanies the heart beat.

A great deal, I am aware, might be said about physical examination of the heart, about the analysis of these sounds, but should I go into that subject extensively, it would make a set of lectures as large as that I am delivering in general. It is only by study along those lines and by practice that you will learn both the normal and abnormal. But I brought them up for your notice, and leave them for the more important part, the Osteopathic practice, which I shall consider here.

III. EXAMINATION OF THE LUNGS:—We adopt the same methods for percussing the different regions of the chest. For instance, if you were sounding here over the clavicle, you get a dull sound, while in the space below we should get a resonant sound; over the larynx, especially with the mouth open, you get a higher sound called tympanitic. You must become accustomed to these normal sounds. Anything which will cause a solidification of the lungs about the tubes or thickening of the tubes themselves, in fact an accumulation or any growth which aids transmission of sounds will change the character of these sounds, making them more resonant; while the effusion of any liquid, such as blood in hemorrhage, or in the case of pleurisy the effusion of lymph or serum, or the accumulation of pus, will also interfere with the sound and make it more dull. There is a tympanitic sound found in the lung when there is a large cavity not communicating with a bronchus; when the cavity communicates with a bronchus we get what is called the "cracked-pot sound."

Our chief methods of examining the lungs are by percussion and auscultation; these are two of the best methods. If I had time to go into the subject more fully I would spend more time upon it. As it is I can best call your attention to the more important Osteopathic points in relation to the lungs by taking up certain of the troubles which affect the lung. As for instance in asthma you may have trouble anywhere along the back from the second to the seventh ribs, especially on the right side. It is said that the sixth rib upon either side may be displaced and cause this trouble, or if there is any pain upon taking a deep breath probably the fifth rib is interfered with. There also may be an interference with the phrenic and pneumogastric nerves in the neck, some stoppage of the nerve-force in those nerves will cause asthma. In case of bronchitis it is said the first, second and third ribs are at fault, especially the first, or the clavicle may be displaced downward, or either of the nerves I have mentioned in the neck may be impinged upon.

In congested lungs you will find the best method is to work along the upper dorsal region, raising all the ribs. I have at that point very quickly relieved the congestion in the lungs, simply raising all the upper ribs; working between the shoulders. Hay fever is

usually found in lesions from the third cervical down to the fifth dorsal; you may have trouble either in the neck or of the upper ribs, or the clavicle may be displaced, or those nerves I have mentioned may be impinged upon. In working upon any of these troubles where there is probability of complication with general troubles, you must take that into consideration. In relation to the lungs, Dr. Still has been speaking recently of the formation of gases upon the lungs, and says that in fever the gases are formed but are not transformed into perspiration; therefore the natural cooling process does not go on and you have fever resulting. In fever his work is largely upon the lungs, he says, to stimulate them to action to cause the proper combination of gases and the resulting perspiration. In the same way he explained the cause of the abnormal amount of secretion of sweat in cases of cholera.

As to HOW TO RAISE THE RIBS: I brought out the points of examination for the ribs the last time. Dr. Charlie Still has the patient take a *deep breath*, and then by placing the fingers of one hand upon the spinal end of the rib, and of the other on the sternal end of the rib, he pushes the rib either up or down. This is one method which he uses. Dr. McConnell frequently works with his *knee in the back*, as do also the other operators, and in that case the idea is to place the point of the knee at the angle of the rib which is displaced, and then you can have one hand free to reach over the shoulder of the patient and get at the sternal end of the rib, while with the other hand you bring the arm up, thus tensing the pectoral muscles and the latissimus dorsi, which are attached to the ribs; drawing the arm toward the head, back and around in such a way as to draw the ribs up. When you have gotten them up to their highest point, then relax the arm and let it drop, still holding the knee and the hand against the ends of the rib. Dr. McConnell, also sometimes works with the knee against the back and by putting both hands against the front part of the rib, especially when he wants to raise the front part. It does not make very much difference, anyway you can get tension of the pectoral muscles and the latissimus dorsi, getting a leverage on the ribs, and having a fixed point against the ribs behind; no matter how you do that you will be able to move the rib. There is another way which is frequently used, and that is, the *patient being upon the table upon his side*, you can place the knee in the back in the same way, you can place one hand upon the arm of the patient, the other upon the anterior end of the rib and draw the arm up and back in the same way; thus you can raise any one or all of the ribs. Also, as I showed you the other day in treatment of the liver, you can *reach across and beneath the patient*, getting your fingers against the angles of the ribs and using the tension of the pectoral muscles in the same way to draw the ribs up. You will find all of those methods quite simple, and the reason, perhaps, that there are so many different ways devised to raise the ribs is

the fact that you have to work in so many different positions, sometimes one will be more convenient, sometimes the other. This will serve to raise the different ribs.

When you come to the *first and second ribs* it is a different matter. These displacements are usually upward owing to the scaleni muscles being attached to them. Hence to treat them, we make use of these muscles. When these ribs are up, one good way is to bring the head of the patient toward the side of the rib affected, then pressing the fingers down behind the middle of the clavicle you come to the first rib. You can bring firm pressure there, and can bring tension by pushing the head in the opposite direction, thus stretching the scaleni muscles which are on a strain and which are holding the rib up. Thus we get those muscles stretched, and by moving the head around and bringing pressure still upon the first rib, you can press it downward. That applies to both the first and second ribs. Of course, also, in case of the second rib you can get the pressure against the angle behind and raise it by working in the back, drawing up with the pectoral muscles as before shown.

Dr. Harry Still frequently works as follows upon the upper ribs; in this way you can get your hands upon the first two ribs. He puts one hand beneath the angle of the rib, the patient lying on his back, and with the other he grasps the elbow of the patient and presses the arm down across the chest, thus springing the ribs out and up, and can get quite a leverage in that way. This is very good for the upper ribs. In case of overlapping or twisting of the ribs the same motions that I have already shown you for raising or lowering the ribs will apply. In case you wish to treat the cartilages alone, which you must not omit in your examination, it is well to work with the fingers against the cartilages in front, drawing the arm up about the level of the shoulder and pushing it backward, you thus raise the ribs and free the cartilages, and you can work any twist out of them in that way, or work them up or down at the time.

As to the *lower two ribs*, they may be up or down, or slipped or twisted in different ways. One of the best methods is to flex both knees, then, by placing your thumb against the point of the rib which is out, you can bring pressure there, with the fingers of the same hand back of the angle of the rib, then by drawing the legs down you can stretch the muscles. In case the displacement has been downward by contraction of the muscles, you will hold the rib up and thus stretch the muscles. Or in case the rib has been displaced upward you must work it down as you go by tension of the muscle in straightening of the knees, and by pressure with the thumb. Dr. McConnell has the patient take a deep breath, he then, in case the rib is displaced downward, exaggerates it by pressing it still further downward

at the free end and upward at the spinal end, then, when the patient lets the breath go, he will simply work the part up; he thus springs the part, gets a fulcrum by having the lung inflated and allows the rib to take its natural position. You cannot always set a rib at the first treatment. It will sometimes take considerable attention and considerable length of treatment to effect your object. There is also one more method which I saw Dr. Charlie Still use the other day for raising the floating ribs, or any of the other ribs. This is what you would call, a quarter turn. He places his arm under the legs of the patient and brings him around until he is a quarter turned off of the table, then he swings the patient downward, backward, and upward, on to the table again, meanwhile he has kept the fingers of the other hand against the angles of the ribs, and thus by pressure of the hand worked them back into place.

Q. Demonstrate to us the method of giving immediate relief in severe cases of asthma.

A. Any of the methods that I showed you of raising these particular ribs on the right side.

Q. In the case of the eleventh or twelfth ribs being pressed in toward the liver, would the motion you gave us bring it out?

A. Yes, sir, by relaxing the unnatural tension, no matter which way the parts are. These motions were given to either raise or lower the ribs. In the first place, the motion of extending the limbs will, by the tension brought upon the quadratus lumborum, draw the limb down. You also push under with your thumb, and place it against the point of the rib working it outward as you go.

Q. If one lung is badly diseased would it affect the pulse on that side?

A. Not particularly on that side, it would probably affect the pulse in general, probably make it weaker.

LECTURE XXII.

At the last lecture I considered the heart and lungs, taking up first some nerve centers for the heart and lungs, showing that the theory of our work was, first, that we work along the splanchnics, getting a general equalization of the circulation, a general effect upon the heart and lungs, and further that we especially work in the upper dorsal region for this effect. I also showed you the relation between intercostal and infra-mammary pains—pains coming from the 6th, 7th, and 8th cutaneous nerves referred back to the 4th, 5th and 6th intercostal nerves, these connecting with the plexus about the aorta, and in that way with

the heart; also that in the same way a connection could be traced from the viscera to the spinal nerves, especially the 4th, 5th and 6th; and explained the visceral pains referred to the surface of the body about the shoulders and between the scapulae. Then I mentioned certain accelerator fibers for the heart and lungs, and took up the examination of the heart and lungs, but had not time to go into the treatment of them. I also showed you the different methods of raising the ribs. To-day, in the latter part of my lecture, I wish to consider the general treatment of the heart and lungs.

Having previously taken up the spine, head, its parts, and the thorax, we have now come to the abdomen, which I wish to consider to-day. First, however, some general points concerning the LYMPHATICS. Occasionally the question arises in an Osteopath's mind, what is his duty in reference to the lymphatics? What can he do with them? Since they are important in the nutrition of the body, how can he gain control of them? Of course, since they have to do with nutrition, they are affected by general conditions of the body. Anything which affects the general nutrition of the body will affect the lymphatics, and vice versa. You find glands along the lymphatics, conglomerate glands, as they are called, especially in the neck, although every part of the body is supplied with them. I have mentioned the fact that the lymphatics are scavengers, and that if you note any enlargement in the neck, it shows some trouble in the head. I have one case particularly in mind, a case of measles, followed by a serious trouble of the eyes, where these glands were enlarged, and had been so for quite a while. Another case of measles with whooping cough had been followed by enlargement of the glands. Another case I noted where an operation had been performed near the knee for abscess, it was on a cadaver that I saw it; the glands at the groin were still enlarged, that being the set of glands in the course of the lymphatics which drained the lymph from the limb. In tonsillitis, or septic processes, these glands are affected. It is well that is so, for they prevent the passage into the blood of this septic matter, which would result in blood poisoning. In such cases I have called to your mind that you must not treat directly over the gland, but indirectly, to remove the original cause.

*As to the direct treatment that we give to the lymphatics, you often find that the clavicle is down, and in such case it may stop up the opening of the thoracic duct into the subclavian vein, so we have to look to see whether or not the clavicle is lowered. The first rib may cause the same trouble by being raised. A tightening of the tissues in these parts may cause a stoppage of the thoracic duct or of the right

*See Appendix, 15.

lymphatic duct. Little is known concerning the innervation of the lymphatic system. It is known that the lymphatic vessels are supplied in their middle and inner coats with involuntary muscular fibers. The physiologists tell us that the flow is influenced in three main ways. First, the general muscular exercise of the body, aided by the action of the valves in the lymphatics which prevent a backward setting of the lymph, helps forward the flow. Another method by which its flow is aided is the movement of the thorax in inspiration and expiration; the pumping motion of the chest. The third way is the *vis a tergo*, the force of the circulation behind—the continual expulsion of the lymph from the blood vessels forcing the onward flow of the lymph in the lymphatic system. The flow is restricted by the presence of the glands in the course of the lymphatics.

However, it is stated that there are certain nerves controlling all these lymphatics. That there are fibers in the upper cervical region which control the caliber of the duct. That probably the thoracic duct itself, and the general lymphatic system are under the control of the sympathetic system. And the receptaculum chyli is probably under control of the splanchnics directly. There is a point at the fourth dorsal called by Doctor Still the center for nutrition. He works there in cases of obesity, as well as in the upper cervical region. In cases of obesity also there is frequently an enlarged cushion, you might call it, of flesh in the upper dorsal region; you will find it in almost every case where a person is extremely fleshy. It is said that the enlargement affects not only the general condition of the body, but the heart and the eyes as well, and I have frequently seen it so. In the treatment of obesity, we treat in this region to reduce that cushion of flesh; work also at the 4th dorsal and in the upper cervical region, working along the transverse processes, alternately stimulating and inhibiting nerve force, and thus getting an effect upon the thoracic duct. So the Osteopath sometimes works directly to remove some obstruction, as for instance, at the clavicle or the first rib, and then the effect that he may get through its nerve supply, added also to the effect that he gets by general manipulation of the body, the stimulation of the lungs, and the working of the parts, which would all aid the onward flow. And where the trouble with the lymphatic system is due to the general condition of nutrition, there he would get his indirect effect by working upon the lungs, heart, bowels, liver, kidneys, and all the excretory and nutritional organs.

As to the ABDOMEN, we know that it is important to us from the fact that its contents are so often complicated with disease. It contains important organs of nutrition. These organs are directly accessible to pressure from the outside, hence it is the Osteopath works so frequently upon the abdomen. Here I believe, too, we are in danger of becoming

masseurs—simply to knead the abdomen, as you might say, which is not the principle at all, although we work upon the abdomen and frequently knead it. The principle is to work for the blood and nerve control, as in other cases; occasionally we do use kneading to force onward the fecal matter in the large intestine.

The abdomen is important, then, since it is related to the general health, and is readily reached by us. The fact, also, that we reach it through the splanchnic nerves along the spine, of which I have already spoken, and through the solar plexus in front, which we can get by deep pressure, makes it an important part to us. When we work upon these nervous connections we have influenced the various viscera, since they are all connected.

II. SOME NERVE CENTERS AND NERVE CONNECTIONS OF THE ABDOMINAL CONTENTS. The general facts in this connection have already been considered. I have mentioned the effect of abdominal tumors—the fact that a tumor pressing upon the sympathetics may produce an effect in distant parts of the body. I call your attention again to the familiar splanchnics. You know where to reach them; nervous influence passes from them to the solar plexus, the solar plexus is intimately connected with the other prevertebral plexuses, viz., the hypogastric and the cardiac, and these in turn are connected with the secondary plexuses—the diaphragmatic, the superior and the inferior mesenteric, the renal, the coeliac, prostatic, vesicle and uterine, and all the secondary plexuses. So it is not strange that, as I stated, there will hardly an hour pass in your practice that you will not work upon the splanchnics and the solar plexus, through which we reach the abdominal organs. Because, as you know, this chain of sympathetic ganglia extends the full length of the cord; there are four lumbar and four sacral ganglia, and branches from the lumbar cord pass to these plexuses of the sympathetic and have to do with the life of the viscera. Sometimes reflected impulses are sent, as for instance, abdominal tumor causing hypertrophy first, and then degeneration of the heart.

However, to take a slightly different course, I wish to call your attention to the explanation given for a frequently observed phenomenon, that is, in hysteria frequently a pain is felt in the hip or knee, a cramping of the leg, or pain on the inside of the knee. The explanation given by Hilton is as follows; that from the ovaries and uterus, which are supplied by sympathetics, branches run back to the sacral sympathetic ganglia, thence branches run to connect these organs and nerves with the great sciatic and with the obturator nerve, also with the sacral plexus of nerves. Now, the great sciatic, as you know, supplies the thigh, or at least sends branches to the hip joint, and the obturator also has articular branches to the knee joint. Hence, it is not strange that uterine irritation may produce

a pain along the paths of these nerves, and may affect the hip or knee-joint or both. The same thing is noted in intestinal diseases, where the irritation in the lower bowel may send the same kind of an irritation over the same nervous connections and on down the leg, and you have a sciatica caused by trouble in the bowel. Cases have been noted frequently in our practice, where a pregnant uterus or the pressure of a large amount of fecal matter will cause a cramping of the leg; a twisted ilium would have the same effect. These nerve connections are all extremely interesting to us. However, we should not lose sight of the main points in our work upon nerve conditions; when we are considering nerve connections we are apt to become too theoretical. If we can trace the pain up the leg to the sacral plexus and find a twisted ilium, we have done the work which is almost peculiar to the Osteopath. So it is that we must look for the original cause whatever it may be. And remember that it is very frequently that the Osteopath finds a displacement of parts, and the successes of our practice have been largely because we understood where to look for and how to adjust misplaced parts.

In the first few lectures I gave you certain centers which had to do with the viscera, for instance, the second lumbar, being the center for parturition, defecation and micturition. But there are other nerve fibers supplying these parts which I wish to call to your attention. I noted the fact that Dr. Still calls the nutrition center in general from the 6th dorsal down, and so you will see that it has to do with visceral life, and hence with the nutrition of the body very largely. Quain, in speaking of the lumbar portion of the sympathetics, says that spinal fibers descend in the cord from the lower dorsal region, and that fibers also pass from the first one or two lumbar nerves to the plexuses of the sympathetics, and that they carry vaso-constrictor and secretory fibers to the lower limbs. These have been demonstrated more particularly in animals, but there is not much doubt but that they exist in man; also vaso-constrictor fibers to the abdominal vessels are found in these nerves; and motor fibers to the circular, and inhibitory fibers to the longitudinal muscles of the rectum.

From the lumbar nerves we get, first, motor fibers to the bladder. They pass down to the hypogastric plexus on the pelvic plexus, and are then distributed to the bladder. They supply the circular muscles, including the sphincter of the bladder, and probably also some inhibitory fibers to the longitudinal fibers of the bladder. In the next place, we get motor fibers to the uterus, which follow the same course as the motor fibers to the bladder. It is a fact that there are no spinal nerves from the sacral region running to the ganglia of the sympathetic. The spinal fibers which run to the sympathetic ganglia in this region come from the lumbar cord or from the lumbar nerves, and it is through the spinal branches of the sacral nerves that we get the effect that we do by our Osteopathic work in the sacral

region. Hence, the importance of all the work the Osteopath does upon this region for the pelvic viscera. Frequently you work along the lumbar region to get an effect upon the organs contained in the pelvis, and it is on account of the sympathetic connections here rather than with the sacral cord, that we work here. However, we work also down lower, but where we work in the sacral region we get an effect upon spinal nerves. The fourth sacral nerve, spinal, having branches from the second and third, and sending branches to the fifth, is called by Gaskell one of the pelvic splanchnics, as it has visceral branches. Having connection with these upper sacral nerves it runs out to form a plexus with the sympathetics, and goes to the bladder and other pelvic viscera. We frequently work over the sacral region to release tension there; set the coccyx, or set a slip in the innominate, or remove anything which may affect nerve force.

From these visceral branches of the sacral nerves we get the following: First, motor fibres to the longitudinal, and inhibitory fibres to the circular muscles of the rectum; second, motor fibres to the bladder, probably chiefly to the longitudinal muscles. Third, motor fibres to the uterus; fourth, secretory fibers to the prostate gland. So here we have a rather anomalous condition of working directly upon the spinal nerves to get a direct effect upon the viscera. You will find that from the sacral fibres, through the spinal nerves, we get certain fibres to the bladder and rectum which are contrary in their action to the fibres to the bladder and rectum derived from the lower lumbar region; for instance, the fibres to the longitudinal muscles of the bladder are motor, while those to the circular muscles of the bladder are inhibitory in the case of the sacral nerves. In case of the lumbar, they are just the opposite—inhibitory to the longitudinal muscles and motor to the circular muscles of the bladder. This applies also to those to the rectum, so that you have for the bladder and rectum in one case motor fibres, and in the other case inhibitory fibres, and thus you have it under your control.

The Osteopathic centers for these parts I have already given you. You remember that we work upon the fourth sacral for the sphincter ani, upon the fourth to relax the vagina, and upon the second and third for the sphincter of the bladder. In passing, I might also call your attention to the importance of the fifth lumbar as a center. It is important, in the first place, because we so very frequently get a displacement there, it being the point of weakness, the junction of the spinal column with the pelvis; and important, in the next place, because it is a center through which we work to reach the hypogastric plexus.

There are certain points about the abdomen which may be more or less familiar to you, which I wish to bring up for the sake of refreshing your memory before we proceed further. These are according to Holden as before. The *linea alba*, as you know, extends from the apex of the ensiform

cartilage to the symphysis of the pubes, and is the thinnest part of the abdominal wall. The *lineae semilunares* extend from a point at the level of the anterior ends of the seventh ribs down to the spines of the pubes, bulging outward; the parts between them are attached to the linea alba and to the semilunares, and are sometimes filled with extravasation of pus or fluid. The *lineae transversae* are usually all above the umbilicus, the lower one being about on a level with the umbilicus. These lines on statuary are almost always exaggerated, making the abdomen of a muscular man look like a chess board, which is not correct. These are interesting to us further from the fact that any one of these squares marked off by the transversae and linea alba may contract, or any one of them may become filled with pus, and simulate some deep-seated abdominal tumor or other disease.

MARKS ABOUT THE PELVIS:—In the erect position a line drawn between the highest points of the crests of the ilia is just about on a level with the promontory of the sacrum. The *umbilicus* is sometimes stated to be the center of the body. But it is a little nearer the pubes than the ensiform cartilage. It is not true that if a man should lie down on his back with his arm outstretched, a circle drawn with the umbilicus as its center, would just include the extremities, because this center varies with age. It will be just above the umbilicus at birth; at two years of age it is just at the umbilicus; at thirty it is just below the pubes in man, and just above in woman. Of course it depends also on the length of the legs.

The *bifurcation of the aorta* is just about the level of the promontory of the sacrum, or you might say, level with the highest point of the crests of the ilia. The level of the umbilicus, referred to the spine, is about that of the *third lumbar vertebra*. It is said that, taking a point one inch below the umbilicus and slightly to the left, compression may be made upon the aorta. This point is taken because above the umbilicus there are structures which might be injured by deep pressure. By feeling here you can note the pulsation of the aorta. Cases are on record where the aorta has been compressed here, under chloroform, for a time sufficient to cure aneurism of the abdominal aorta. The *umbilicus*, as you know, is sometimes pervious, being the remains of the foetal artery it sometimes does not close. It is deeper and wider in women than in men. As it is sometimes pervious, there may be a hernia here, or escape of pus, or of ovarian fluid, or of entozoa. The umbilicus is also a good *fixed point* from which measures are taken in case of diseases where it is necessary to compare parts of the body. Measurements are taken to the ensiform cartilage, to the anterior superior spines of the ilia, or to the symphysis. It is frequently useful in fracture to measure to the anterior superior spines to see how much the parts are displaced.

In the median line behind the *linea alba* we have first, the *liver* just below the ensiform cartilage, and extending about the breadth of three fingers. Second, the *stomach*, which, when distended, presses the transverse colon down and occupies the space between the umbilicus and the liver. When empty it recedes, leaving a slight hollow on the surface, "the pit of the stomach." The *transverse colon*; when not displaced, the middle of it is just above the umbilicus. You will frequently want to know where to find the transverse colon, and you can work on it here with a sufficient degree of certainty. However, you must bear in mind that it is sometimes slipped out of position, as in enteroptosis. Cases are on record where it was found as low down as the floor of the pelvis. Behind and below the umbilicus are the *small intestines*, when they are not displaced by a distended bladder. The *peritoneum* is loosely attached to the abdominal wall; when the bladder is not distended this peritoneum is in contact with the *linea alba* all the way down to the pubes. But when the bladder is much distended it rises sometimes half way to the umbilicus, then the peritoneum is pushed back by the bladder, and between the peritoneum and the abdominal wall there is a space of as much as two inches. A case is on record where in the seventeenth century a blacksmith cut open the bladder there and removed a large stone. Of course, cutting the peritoneum would have been a serious matter.

When you wish to find the *division of the aorta* it is a safe way to find a point a little to the left of the center of a line drawn between the highest points of the crests of the ilia. And, as I said, compression can be made at this point. A line bulging slightly outward from this point to where you feel the pulsation of the femoral artery will mark the course of the *common and external iliac arteries*. The first two inches of the line belongs to the common iliac artery. Of course these things vary, the aorta may be longer or shorter, the bifurcation coming above or below, or the common iliac may be longer or shorter. There is one point in the examination of the thorax which I failed to mention, and that is what is called *succussion*. When there are fluids in the body cavities, especially in the pleura, a quick shake and then the application of the ear to the chest wall will give you a splashing sound called *succussion*.

TREATMENT OF MAMMAE:—You will find in your practice that the mammae are swollen, inflamed and perhaps caked, and especially at the menstrual period. In such cases it is a very good plan to free the circulation by spreading the upper ribs both in front and behind. Raise them well and raise the clavicle, for there may be obstruction to the internal mammary artery, especially at the second interspace, where the artery perforates and runs to the breast. You will have good success in treating such cases.

GENERAL TREATMENT FOR THE HEART AND LUNGS:—

As I have said, this is just the indication of the general treatment. Dr. Harry Still said in an article in the last Journal that you cannot give a recipe for each particular treatment, and it is foolish to try to do so. If you write a recipe and try to follow those directions for any one case, you are liable to get into trouble, because cases vary. As he says, there are just as many nervous systems as there are human faces, and just as many kinds of paralysis as there are nervous systems. Thus it is that I can give you only the general treatment for these conditions. In treatment of the lungs, your idea is to work upon the upper dorsal region; you know the center is from the second to the seventh. However, I might say concerning the heart and lungs, that they are very closely related. When you have trouble with one you frequently have trouble with the other, and they are so closely related to the general health, that if you find trouble in one place you had better look also in the other. In treatment of the lungs, one of the chief things to do is to raise the upper ribs; put your fingers on the angles of the upper ribs and work, pushing the shoulder down and back. Or you can set your patient upon a chair and place your knee in the back, or your thumb, in the same way. I have relieved congestion of the lungs very readily in that way.

Also, in treating the lungs it is a good idea to place the thumb between the clavicle and the first rib, push the arm across the chest and back over the face. That, of course, separates the clavicle and the first rib. I have noticed Dr. Harry Still use that method frequently, and the idea there is to spread these parts, give the blood vessels free play—the subclavian, and also we get an effect upon the phrenic and the pneumogastric nerves which pass behind the first rib in front of the scalenus anticus muscle. It is also important in working upon the lungs to pay attention to the condition of the pneumogastric and of the sympathetics. Hence it is that we work in the superior cervical region, and also upon the middle and inferior cervical ganglia of the sympathetic. I have already shown you how to treat them. Now, the irritation to the vagus may of course be sufficient to produce results in the lungs. It has to do with the caliber of the bronchial tubes; it gives them motor, dilator and constrictor fibers, so that if it is irritated it may cause contraction and cause a case of asthma, or something of that kind. The irritation may be in the stomach or in the throat, or anywhere where it may irritate the pneumogastric nerve. If the superior laryngeal branch is irritated it may result in catarrhal pneumonia. So you must look carefully to the nerves and treat them in the neck at the points I have indicated. The third, fourth and fifth cervical are particularly noted because any displacement here is liable to affect the sympathetics, which has to do with the involuntary movement of the lungs. Then the first and second ribs

and the fifth rib are particularly noted, but all the ribs from the second to the seventh are included, and all the upper part of the spine.

I might tell you also how to treat the HEART; it is largely a repetition of what has been said for the lungs, because the phrenic and pneumogastric also supply the heart, and you must always look to them. We frequently work upon the pneumogastric nerve in the neck, holding against it, thus inhibiting its action, to increase the beat of the heart, because we thus cause the inhibitory fibers of the pneumogastric to cease functioning. That is simply an adjuvant: as I have said before, we can get a better effect in quieting the heart, or stimulating it, by working in the region of the splanchnics and along the upper dorsal region, especially on the left side. The motions I have already given you—any of these spreading motions to spread and raise the ribs, will relieve the heart trouble. As I have said, I am giving you only the general treatment. In any particular case you will probably find some one thing the matter, you might find the clavicle down and affecting the heart, you might find the first and second ribs up and affecting the heart, and you might find any particular rib in the upper dorsal region displaced, affecting the heart.

Q. Suppose you were treating a case, and the patient should faint on your hands, by what means would you bring him to?

A. A good way is to first get the head of the patient as low as you can; just let it hang over the lower end of the table; and to refer to Dr. Harry Still again, he says to slap them, pull their hair or anything to get the blood started to the head; a dash of cold water in the face may be a good thing.

Q. In case of too much blood to the head, how would you go about treating it to throw the blood away from it?

A. I would work first along the splanchnics.

Q. Stimulating?

A. I would loosen all the muscles, first, in the back, and then I would have the patient turn over, and I would inhibit or press deeply over the solar plexus, to get the blood from the head. You will have to find out the cause; the cause may be an impacted colon preventing the circulation in the lower part of the body. Or you may stimulate the lungs and get it started through the whole body; your idea is to equalize the blood flow.

Q. In case of too much heart action, what would be the quickest way to reduce it?

A. The quickest way that I have found is simply to separate the upper ribs and raise them on the left side, and I have done it by the count, I have lowered it as much as twenty beats, and it stayed that way until the next treatment; when the patient came back two or three days later the

beat was the same. Of course that is an exceptional case; you cannot always reduce it that much.

Q. Please give the treatment to increase the heart beat?

A. You should inhibit the pneumogastric, thus letting the heart run faster; and then you would take the same movement, because the object when it is too slow is a stimulation, and by raising these upper ribs, whether it is too slow, you may increase it, or if too fast you can lower it. I have gotten effects either way.

Q. Do lymphatics remain enlarged after the septic condition has passed away?

A. That is a very hard question to answer. I have seen them stay enlarged so very long that it looked as if they might. They may stay enlarged a long time, but it is possible there is trouble there yet, especially if the person is in poor health. They may hypertrophy.

Q. Why are they enlarged in one place and not in another?

A. Because certain parts of the lymphatic system drain certain parts of the body.

Q. The treatment you have given would be good also for irregular heart action, would it not?

A. There are many things that would cause irregularity of the heart. As I have said, a stoppage of the subclavian vein, causing a periodical emptying of it, caused by a slipping of the clavicle, would cause the heart to lose a beat. An irritation to the sympathetics in the dorsal region would cause a constriction of these vessels and thus an irregular filling of the heart, causing it to lose a beat.

(Dr. Harry Still) I will tell you, doctor, when it originates from the stomach, you can press upon the pneumogastric and quiet it. Simple pressure, from two and a half to five pounds pressure, for a minute and a half to two minutes.

LECTURE XXIII.

To-day I wish to consider further the abdomen and its contents. I have already given you certain centers for the vaso-motor control of these parts, necessarily so in considering the splanchnics. But there is much more that might be said, so I will mention some further fibers which go to these parts, which teach us how we can control them.

First, as to the STOMACH. We know that we reach it through the solar plexus and through the splanchnics, also through the vagi. We must not forget in dealing with the stomach that probably Auerbach's and Meissner's plexuses have to do with it as well as with the intestines. Robinson says that the gastric and intestinal secretions are under the

control of Meissner and Billroth's plexus, aided by Auerbach's plexus. Further, note certain statements in Howell's Text Book. The mesenteric vessels are under the control of the splanchnics, which contain both vaso-dilators and vaso-constrictors. The vaso-constrictors for the jejunum are as high as the fifth, and extend from there down, it does not state how far. Those for the ileum a little lower, and those for the rectum come off still lower along the splanchnic region. There are none, however, below the second lumbar. The vaso-dilators are present in the same nerves in these regions, and here is a chance to bring in a point of whether we inhibit or stimulate. I think we understand fully that point, and do not think that we will split hairs over those things. However, the vaso-dilators are more abundant in the lower three dorsal and in the upper two lumbar. The vaso-dilator and vaso-constrictor fibres of the splanchnics, ending in the solar and renal plexuses, have the vaso-motor supply of the liver. The splanchnics contain the vaso-dilators and vaso-constrictors for the liver probably. It is said that there are vaso-dilators also in the vagi nerves. However, this matter is not settled, and they are not perfectly sure about the existence of these fibres. But it makes little difference to the Osteopath, since he can rule the flow of blood through the liver in other ways, as we shall see presently.

As to the KIDNEYS, there are vaso-motor fibres from the sixth dorsal down to the second lumbar. You know that we can get, more easily perhaps on the kidneys than on any other organ, a vaso-motor effect reflexly by the application of cold to the skin. Also, by stimulating the sciatic nerves it has been found that one can get a vaso-motor effect upon the kidneys. This seems to be in line with what has been said concerning an equilibrium between the blood flow in different parts of the body. There are certain centers that the Osteopath works upon. Doctor Still says there is a center in the skin, that is, a peritoneal center about one inch each side of the umbilicus, and that work there is beneficial both upon the kidneys and upon the intestines, and we often make a mere spreading motion there at the umbilicus, just press in deep and spread, not hard, for effect on the renal veins and arteries. That always seems to have a good effect in treating the kidneys. Of course you know the micturition center is the second lumbar but you have already been cautioned not to go too much according to centers; look for the lesion, which may be some place away from the center.

As to the SPLEEN, it is found that stimulation of the peripheral end of the splanchnics will cause quite a change in the size of the spleen, that is, in its bulk, but it is not really known whether it is on account of vaso-motor control or because of an effect upon those involuntary muscle fibres which you saw under the microscope—you know how the capsule and the trabeculæ of the spleen are well supplied with involun-

tary muscle fibres, and you remember how the oval nuclei of those fibres are easily seen. However, from the Osteopath's point of view, it makes little difference whether he can in one way or the other change the size of the spleen, so long as he does it, that is what he is after. He does not care whether it is through muscular or vaso-motor control. Should he do that, of course he would thus change the flow of blood through it. There is a great deal not understood about the spleen. There is a very good Osteopathic point, however, in the treatment of the spleen in connection with treatment for gall stones. You can treat for gall stones and remove them, but they will form again unless you treat the spleen on the left side over the ninth, tenth and eleventh ribs. That is part of the practice. I have not heard that statement refuted. Another point as to the spleen—in treating it you will sometimes find it congested; it is like the liver in that respect, they are both liable to congestive disturbances. You may, by working deep in the left hypochondriac region, reach the spleen, but when the spleen is distended with blood it is said it is very readily ruptured; and if you find the spleen enlarged and tender I would advise you to treat rather over the back through the spinal nerve supply than over the abdomen. I think I might emphasize once more the importance of the Osteopathic work upon the abdomen. As I have already said, I think here we are in more danger than anywhere else of becoming masseurs. Indeed, I do not think we need to learn the baker's trade before we can work on the abdomen, and we ought to bear in mind that although we knead there, we work there as directly as in other parts of the body for nerve control and for the blood flow. And the fact that we knead the abdomen occasionally is not any sign that we simply knead it, as a masseur does. Of course, there are times when we depend upon the mere mechanical movement, as when we begin at the sigmoid and work on back to loosen the fecal contents, but our chief work is upon the nerve supply. I think I have already mentioned the point that by work upon the abdominal peripheral terminals we can stimulate or inhibit. I merely call it to your mind again, that by getting the peripheral terminals in the organs of the abdomen, which we can reach by pressure over the abdomen, and by getting these various plexuses from the solar down, we can get an effect upon these organs, and that is what we are reaching when we are working upon the abdomen. For instance, we frequently work along the whole length of the large intestine. What are we doing? You will remember that Auerbach's and Meissner's plexuses are found, the first between the muscular coats, and has to do with the motions of the intestines; and second deeper, in the submucous coat, and has to do with the secretions. Now, we may work in the region of the abdomen, and the beginning Osteopath, who does not understand, may think he is simply

kneading, but such is not the fact, we are reaching terminations of nerves. You know what the plexuses look like, with their meshes, in the inter-nodes of which are ganglia; they (the ganglia) are centers upon which you may work directly by pressure over the abdomen. Thus it is that we get the best explanation in regard to the Osteopath's success in treating abdominal troubles, such as constipation, diarrhea, enteritis, and a whole list of troubles which affect man, and our success there is marked. Byron Robinson says: "Gastro-intestinal secretion appears to be carried on automatically by the Meissner-Billroth, aided by Auerbach's plexus of nerves, which are sympathetic ganglia, automatic visceral ganglia." As I have said, since they are ganglia, they are centers, and since they are automatic, they are to a certain extent independent, and by stimulating them, whether we go back to the splanchnics so much or not, we get the effect, as you have an independent source of nerve supply here. Indeed, Robinson in making this statement, is doing so to establish his point that the sympathetic is largely independent in its action. We must, however, couple our work here with work in other places, and we must not forget also that the nerve centers chiefly are along the spine.

We do our work largely here also by the blood-flow. I have emphasized the nerve control and the blood-flow. Robinson says that the movement of the intestines is largely dependent on the amount of blood in the intestinal wall. That is, on the amount of fresh blood which affects the parenchymal ganglia. We have a certain number of ganglia in these walls, they must be supplied with blood if they are to act properly; that is with pure, fresh blood. And by working over the splanchnics, and by this manipulation process you can throw great quantities of blood to the abdominal viscera, and thus supply these ganglia with an added amount of blood. That will also help to explain how we get our effect upon the nervous system there. When you have done that you rule both secretion and motion. Of course that has to do very closely with constipation, diarrhea and those things. Your peristalsis may be too rapid, and thus you would have a case of diarrhoea, or it may be just as rapid, but as Robinson says, futile, and you will have constipation. You have to couple with that work the ruling of secretions through Meissner's and Auerbach's plexuses, and if they are too abundant you have diarrhea; if deficient you would have constipation. The fact there, as in other cases, is that we remove lesions and these secretions attend to themselves, they become normal; a change in the amount of motion, and a change in the quantity or quality of secretions; so we work toward the normal.

We might repeat this for every organ in the abdominal cavity. When we work for the uterus, the bladder, or the intestines, or

ovaries, we work very largely through the nerve control, as is evidenced by the fact that in case of those organs we work generally through the spine, along the lower part. It might be thought that the motions we employ in our work upon the liver are exceptions to this rule, but I think not. We frequently work against the lower edge of the liver, but we cannot work much of its bulk by our direct kneading motion there, and I think what we do is the same as elsewhere, we affect the nerves as well. We affect the hepatic plexus of the sympathetic directly by manipulation, and indirectly through the solar plexus, also through the splanchnics, and the vagi. If you will watch Dr. Harry Still, you will see that he scarcely ever omits to treat the vagi when treating the liver, as it contains vaso-motor fibres for this organ. So our work in kneading is largely work upon nerve connections. There is a good point that I would like to note in speaking of the liver. I have seen a case in which there was hemorrhage from the lower bowel; whenever the trouble occurred there would be a tenderness about the liver, and the portal circulation would be stopped. There is a close connection between the portal circulation and the hemorrhoidal. Here you have this great amount of blood which must pass to the abdomen and through these terminal vessels, and which must find its way back through the portal circulation and the liver, to be worked upon by it. These hemorrhoidal veins connect with the portal veins, so that if you have an obstruction in the liver you are very apt to find trouble in the way of hemorrhoids, or something of that kind. Remember that there is a further object in freeing the splanchnics, as a regulative process. You might say that this is true, but you might go farther and say that the liver in this case is a "stop cock," that it is sometimes turned when it should not be, is stopping the blood, and you have a congestion at the lower bowel. You remember that the liver is particularly liable to congestion. If it is congested the blood flow is retarded and you have a series of abdominal troubles.

II. LANDMARKS FOR THE ABDOMEN.—I began this last time, and wish to continue to-day. In examining a patient, as you all know, perhaps, it is best for abdominal examination and treatment to have the patient flat on the back; have the thighs flexed a little to relax the abdominal muscles; have the head and neck slightly elevated, this will help to relax the recti muscles. Thus you have everything relaxed, and unless the abdominal wall is unusually tense through its own condition, you have a good place to work. Then in working, I believe that beginning Osteopaths "dig" here perhaps as much as in any other place. That is, they use the ends of their fingers. Not only Osteopaths but surgeons make the statement that that is very wrong. Holden says to use the tips of the fingers causes the parts to contract.

Thus you defeat your own object. You should lay the flat of the hand on the abdomen. I have seen the worst digging over the abdomen, and it is wrong, because you are not kneading, and you cannot force any condition there, and you had better not try. Dr. Hildreth always emphasizes the point that in working upon the abdomen you must work for nerve influence; and that is especially noted in typhoid fever, where you have an ulceration in Peyer's patches, and if you try to work matters along mechanically, you are liable to perforate the ulcerated places.

The *central tendon* of the diaphragm is about on a level with the lower end of the sternum, about the level of the junction of the seventh costal cartilage with the sternum. The *right half of the diaphragm* will rise as high as the fifth rib when the diaphragm is extended, and to one inch below the level of the nipple; rather higher than one expects to look for it. The position of the abdominal contents is variable. There is quite a contrast, says Loomis, between the examination of the contents of the thorax and those of the abdomen. In the first instance you have tense walls and contents which may vary but little under physiological conditions. While in the other you have loose walls, you have numerous organs, some of which vary considerably within physiological limits. So you see it is a different matter when you go to the abdomen to examine or treat it, and you must constantly guard against wrong diagnosis by being mistaken which organ is at fault. Then, too, the action of the abdominal organs is more or less peculiar. Take the stomach at different times, it changes its position when it is distended; so it is with the bowels, and according to the position they assume, the others are also displaced; you must bear that in mind.

I wish to call to your attention the *regions of the abdomen*. You know that it is divided into *three zones*—the epigastric, umbilical and hypogastric. The epigastric region is bounded above by the diaphragm, below by a plane passing from the anterior tips of the tenth rib, and between the bodies of the first and second lumbar vertebræ behind. That zone is divided into a right and left hypochondriac region, behind the false ribs, and the epigastric region between. The umbilical zone is bounded above by the epigastric and below by a plane passed from the highest points of the crests of the ilia, striking a point between the first and second sacral spines behind. The lower, or hypogastric zone, is the one below the umbilical, and occupies the region of the pelvis. These two zones are each divided into three regions by an almost vertical plane on each side, passed from the tip of the tenth rib to the pubic spine. In the middle zone the regions are the right and left lumbar and the umbilical, and in the hypogastric zone the regions are the right and left iliac and the pubic. The lower zone is bounded below by the upper edge of the pubes, and by the two Poupart's ligaments,

one on each side. It will not be necessary to detail the contents of these regions, I will refer to the contents as it becomes necessary later.

As to the *liver*, it is found mainly in the right hypochondriac region, and extends across into the central or epigastric region, as far toward the left as the mammary line. It may extend down two or three inches, and at this point, behind the linea alba in the media line is the best place to find the liver; it protrudes half way to the umbilicus, but you will not be able to find it until your hand is educated. The liver may protrude lower in disease. I have seen a liver that weighed sixty pounds; they become enormously large at times. It may extend down, as for instance in tight lacing, when it is not diseased, and you will have to judge what the general condition is. On the right side, where it goes a little higher, it may ascend as high as the diaphragm, about an inch below the nipple, and below or as low as the tenth dorsal spine. The liver is a very important organ. I do not think that with all that Dr. Harry Still says about the liver it is any too much impressed upon our minds, because it is extremely important to us in our practice.

The *gall bladder* will be found just beneath the tip of the ninth rib on the right side, but it is behind the liver, and you are not able to find it. It is only when distended to a great degree that it can be noticed; even then you do not feel it directly. But we work there to get an effect upon the gall-bladder and press its contents out. We work down that duct in a reversed "S" shape to the umbilicus, a little to the right.

The *STOMACH* is one of the most variable organs of the abdomen. You all know how much it descends at times when distended with gas or over distended with food. At that time instead of simply descending, it turns on its axis, and the greater curvature comes to the front, because the greater curvature is not so closely attached as the lesser. When the stomach becomes thus distended it will push away those organs in front, and may even occupy all the space from the lower edge of the liver, or the tip of ensiform, down to the umbilicus. In such a case you are likely to have great dyspnœa and palpitation of the heart. I remember a case in which about three hours after a meal, the gentleman had eaten rather heartily, he had great distress in breathing, his heart was palpitating, and he thought he would die. He called an Osteopath for heart trouble, but the Osteopath worked the undigested food on through the pylorus, and the gas off the stomach, and the man's heart was all right. You will frequently meet that sort of a case, and if you know the probabilities you can be on your guard against it. The *cardiac orifice* is just below the cartilage of the seventh rib where it joins the sternum, and a little to the left. The stomach when empty retreats behind the liver and lies flat; there is no cavity whatever in it. This reminds me of a statement made by Dr. Eckley, that naturally these are but potential cavities. The œsophagus when

not occupied by the passage of food or drink lies with its inner surfaces in contact, it collapses and occupies as little room as possible. The same is true of the stomach. The *pyloric orifice* of the stomach is found on the right, at the edge of the sternum about the point where the cartilage of the eighth rib joins; it is behind the liver and cannot be felt unless it is enlarged by disease.

The **SPLEEN** is on the left side, below the ninth, tenth and eleventh ribs; sounded by percussion over the tenth and eleventh ribs. I have already given you some precautions concerning it. It may become very much enlarged, then you can readily feel its edge, but unless it is enlarged you do not feel it. However, you can get indirect pressure on it under the edges of the left lower ribs. It is forced down sometimes in full inspiration.

The **PANCREAS** is not very easily felt; it lies behind the stomach, transversely, and crosses the aorta and the spleen at the level of about the second lumbar vertebra. I mention it not because you will find it often; you can feel it only when the abdomen is very thin and the stomach entirely empty; in some cases of thin individuals you might mistake it for some disease of the transverse colon.

The **KIDNEYS** also are not readily felt. It is said by Holden that he does not know that he has ever felt the rounded edge of the kidney, but he says it is accessible to pressure at the outer edge of the erector spinae muscle between the lower ribs and the crest of the ilium. It is accessible to pressure because you can get indirect pressure and can know when it is tender. It is sometimes enlarged and can then be felt. It corresponds in position to the lower two dorsal and upper two lumbar vertebrae. A point to know in relation to it is that it will sometimes deceive you, or you will feel masses of hardened fecal matter and think they are the kidney, or vice versa; you must distinguish between them.

As to the **LARGE INTESTINE**, you are familiar with it. The cæcum and ilio-cæcal valve both lie in the right iliac fossa. In the right lumbar region and over the right kidney runs the ascending colon, and across just above the umbilicus you find the transverse colon; the descending colon and sigmoid flexure are in the corresponding positions on the left side. You can reach all of the colon except the splenic and hepatic flexures. However, these are sometimes prolapsed, sometimes sunken, as Robinson states. Dr. Tull, of our own practice, has pointed out that this is frequently the case, and that prolapsus may cause constipation by acting as a mechanical hindrance to the passage of fecal matter along the bowel. You all know the relations of the bowel, and except at those two points you will be able to work upon the intestine directly.

As for the **SMALL INTESTINE**, the jejunum lies in the region behind the umbilicus, and is the part concerned in umbilical hernia. It is be-

cause it seems to be so particularly vital that umbilical hernia is so often fatal. The point concerning the ileum is that it contains Peyer's patches, which are inflamed and ulcerated in typhoid fever; they are in the lower part near the ilio-cæcal valve, and just at the edge of the right iliac fossa. You will have to be extremely careful in treating inflammatory conditions of the bowels, especially typhoid fever and enteritis.

The BLADDER is contained within the pelvis except when distended. It may become over-distended and rise out of the pelvis as high as half way to the umbilicus. As I noted at the last meeting, when it rises it pushes the peritoneum back away from the wall of the abdomen, and sometimes will leave a space as great as two inches between them.

I thought I had better finish the subject in this way to-day, leaving the practical examination and treatment of each one of these important organs of the abdomen until next time. I shall try to finish this subject then.

LECTURE XXIV.

At the last lecture I considered the abdomen, taking first certain centers and nerve connections for the contents of the abdomen—the stomach, intestines, liver, kidney, spleen, and so on, calling to your attention the fact that although we often work mechanically upon the abdomen, our chief treatment there is nevertheless for the reaching of blood and nerve supply, taking especially the case of the liver and of the bowels in constipation. I then took up certain landmarks for the abdomen. I wish to carry the subject further.

*I. EXAMINATION AND TREATMENT OF THE ABDOMEN AND ITS CONTENTS:—In this I do not include the pelvis and its contents, as I shall give a further lecture, taking up that subject. Any one of these various organs may become complicated in disease, and the manner in which it is reached and treated in the various diseases might well take up a lecture, but I think it best to run over the abdomen and its contents, giving the Osteopathic treatment for each different organ to-day, perhaps with the exception of the kidney, which I will take up at the next time.

First, as to the examination of the EXTERNAL PARTS OF THE ABDOMEN. I called your attention at the last time to the need of having the patient raise his knees, thus flexing the thighs slightly, also the fact that our tables raise the head and chest a little, thus relaxing the recti muscles of the abdomen, leaving the abdominal walls relaxed, so that you can

*See appendix 16.

readily examine them by touch. You should also take care to see that the patient is evenly disposed on each side, so that there may be equal tension of the abdominal walls. You see at once that it is necessary to have the parts equally disposed. We use the ordinary methods of examination of the abdomen—inspection, palpation, mensuration, auscultation, and percussion. We use palpation and percussion probably most frequently. The Osteopath depends upon touch largely, and also upon getting the sound by percussion from the different viscera, so these two are the most important methods of examination that we have. We should first inspect the abdomen, this is best done next the skin. We note its general appearance; you will find in some cases enlargement due to inflation from gases in the bowels. In such cases it is very likely to be even. However, some of the hollow viscera, as for instance, the stomach, may be inflated with gas, in which case you would have an uneven enlargement. Further, on inspection you will find whether or not any organ is enlarged. Sometimes the spleen enlarges enormously and pushes farther and farther down through the abdomen, making a bulging enlargement in its locality. Sometimes, as I have said, the stomach is distended with food and gases, and quite enormously so. Sometimes diseases of the liver cause it to enlarge, as for instance in sclerosis of the liver. The liver protrudes below the ribs from enlargement, and makes a protrusion of the abdominal walls, as does also enlargement of the ovaries, and so on. So you should note whether or not the enlargement is equally disposed, as in gases in the intestines, or is at a fixed point, in which case you will learn by other methods how to tell what organ is affected.

We should also note the *temperature*, whether or not parts are cold or hot. It is said that in liver troubles there are often cold spots upon the surface of the body, and we know that in cases of obstruction to the nerve supply at the spine we can trace the cold streak across the body.

Inspection will reveal to you the *color*, which is significant. In some cases the linea alba becomes pale, or there may be splotches of yellow color, as in some diseases of the liver, jaundice, and in other cases. In pregnancy the abdomen assumes different colors, brown, yellowish or black; it differs according to the person. You can make out the outline of any organ and locate it by the other methods of examination.

The abdomen may be *distended* or it may be *retracted*, as in tubercular diseases of children, where it is said the abdomen is retracted. And you will frequently find in your practice that in thin, emaciated people, or in any disease that is wasting, it is liable to be contracted. You will also find that in some cases it is distended. In diseases which affect the thorax, causing pain upon respiration, there is likely to be a change in the abdomen—anything like inflammation of the pleura or pneumonia, there is

restriction of motion and pain on the side affected, while the respiratory motions of the abdomen are increased. On the other hand, in the abdomen when you have trouble which would cause pain upon motion, as for instance, in peritonitis, you have the restriction of motion there, and increased motion in the thorax. You can also by this examination occasionally note changes, even through the wall of the abdomen, as in cases where the heart has been displaced by some disease in the thorax. In cases of aneurism of the abdominal aorta you can see the pulsation of the abdominal wall. You can feel it very frequently. The *caput medusæ*, or little web of veins about the umbilicus, may become enlarged and engorged with blood, indicating that somewhere the blood is interfered with; it is usually in the liver, as in case of scirrhus of the liver, but it may be in some portion of the ascending vena cava.

PALPATION, as I have said, is important to the Osteopath. You can feel the different solid viscera in the different parts of the abdomen. As I have already mentioned, you can feel whether or not there be *tumors* of any kind in the abdominal wall; you can by touch differentiate between those in the wall and those in the organs; you can tell whether or not they are superficial or deep, fluctuating or solid. A solid tumor will give a sound such as you get over the liver—a flat sound; a liquid tumor will give also a flat sound, but will give in addition a fluctuation, which can be detected by palpation. When the abdomen has its walls retracted it is likely to be tense, when extended they are also likely to be tense. In other cases you may find them very flabby, very loose, without tone. In one case there may be too much life, in the other case a lack of life or nerve force. You can detect that by the feeling. You can also detect displacement of the parts; you must examine to see if the parts are in their normal position. The liver may descend considerably; the stomach may be displaced until it is resting upon the floor of the pelvis. The spleen may be enlarged and come far down. Any of the organs may indicate pathological changes, or be displaced or enlarged. The transverse colon you know where to find, just across at the level of the umbilicus. It sometimes becomes loaded with fecal matter and descends, dragging with it the splenic and hepatic flexures. In such case you will be able to make out those flexures. You will also be able to make out fecal tumors—accumulation of fecal matter in the large intestine. If there be pain in the stomach, and it increases upon pressure over the pit of the stomach, it is said to be inflammatory, as in catarrh of the stomach; if it ceases, it is said to be nervous.*

As I have said, the method of PERCUSSION is an important one in examination of the abdomen. In general, percussion over parts which are

See Appendix 17.

distended with gas gives a tympanitic sound of the abdomen, because there the gas is restricted within limits. Over a stomach or bowel distended you get a tympanitic sound. Over the parts contained in the abdomen you get a varying character of flat sounds. For instance, over the liver (you know it is best reached right in the median line, below the ensiform cartilage) we get a flat sound. Over the lung you get a higher, more resonant sound. You can compare sounds in that way. Over the region of the spleen we get the same flat sound; over the region of the stomach likewise. Over the intestine, the same, except the note is of a little higher quality. Remember that in using your left hand as a pleximeter it is best not to place the whole hand on the abdomen, place the middle finger on the abdomen, and then bring the fingers of the right hand into line, or take the middle finger of the right hand, and tap gently for superficial structures, for deeper structures more strongly.

MEASUREMENTS are used but little in our examination of the abdomen, but you can take the umbilicus as a fixed point and measure from it to the anterior superior spines of the ilia, to the end of the ensiform cartilage, or to the symphysis pubes.

AUSCULTATION is made little of in the books. However, I think we use it more than the old profession; it is said it is of little use. Dr. Harry Still uses it very frequently in cases of liver trouble. He says if he finds a gurgling sound over the liver, there is trouble there. That gurgling sound indicates that there is an obstruction to the portal circulation. I have often been able to hear this gurgling sound. It will be quiet for a while and then you will hear a gurgling, and it will be quiet again and you will hear the gurgling again. I am aware you might confuse this with the bubbling of gases in the stomach and intestines, but you will have to learn by general indications what the probabilities are. However, I think auscultation in that way over the liver is useful to us as Osteopaths. Auscultation is also employed to hear the fetal sounds in pregnancy, we will take that up later. Remember also that you must take into consideration the conformation of the spine, thorax and pelvis; take all these parts which will in any way affect the abdomen into consideration in your examination.

It is difficult to say just how to give a GENERAL TREATMENT FOR THE ABDOMEN, because we usually treat there for a specific object. However, as far as a general treatment would go in the abdomen, it would relax the walls. I would lay my hands on the abdomen firmly; I would not take the tips of my fingers, I would not dig, I would keep my hands straight; you know the importance of that. Thus you can thoroughly relax all the surface of the abdomen. We know this is a very effective movement; it is hard to explain. As I said at the last lecture, I believe that

the movements there stimulate the nervous mechanism in the abdomen more than anything else; and mechanically we cannot help but work the blood to the parts. It is very beneficial. It is recommended by physicians in general just to tap the abdomen lightly all over. The masseur works the abdomen considerably in case of constipation, and that mechanically excites a flow of blood. That is, if it is mechanical, but it is hard to believe it is very largely in that way. There is also another movement we might include in the general treatment of the abdomen, that is, a lifting up motion; you can thrust your hands down in deep in the iliac fossa, and raise everything there. You can in that way raise the uterus, bladder and bowels. That is an excellent method of treatment, and has been used with great success.

Next, as to examining and treating the important organs contained within the abdomen. First, the STOMACH. It is hard to confine yourself to a particular part. The stomach, for instance, gives symptoms in all parts of the body. We should notice the face, the expression and the complexion; there may be lack of color, a yellow or clay colored complexion. Also notice the eyes, the odor of the breath, the appearance of the tongue. All these things are indicative in troubles of the stomach. Also vomiting, the belching of gas, and so on. But these things are so familiar to you that I need but mention them to you in the treatment of the subject in this way. However, more particularly as to the stomach locally. You have the point already that you can see by inspection whether or not it is distended. You can also notice by palpation whether or not it be enlarged, by percussion whether or not such be caused by solids, fluids or gases. Now, in treatment of the stomach, you know already that our chief treatment is over the splanchnics; I have indicated to you the manner in which we treat the splanchnics. We also go to the solar plexus, treating by pressing deeply below the end of the sternum, over the pit of the stomach, a pressure of five, six or eight pounds, and thus impinge upon the solar plexus. You thus get an effect on the stomach, since the plexus has control of the coeliac blood supply, as well as various other blood vessels in the abdomen. Sometimes we treat the stomach mechanically by raising the ribs, as we would on the right side in liver trouble. It is the usual motion of raising the ribs. Or you can set the patient up, have him take a deep breath, and put the fingers in gently under the ribs and raise upward and outward as he exhales, thus freeing the parts in that way. In any treatment we wish to reach the splanchnics, the solar plexus, and an important point in the neck. We reach the vagus along the sides of the neck and behind the clavicle, where it passes behind the first rib. At the atlas, it is said a displacement to the right will interfere with the right vagus. In the case of nausea we inhibit upon

the left side between the fourth and fifth ribs. You know how to find these interspaces. I thrust my thumb into that interspace. The spine of the scapula is opposite the third, then coming down a little over an inch, you will readily be able to find where the interspace is; then you must raise the arm a little, just enough to relax those parts, and thrust the thumb deeply in that interspace. That is one way of treating nausea, but it depends upon the cause. I have had cases of nausea in which that would not succeed, the pressure gave no relief, but general work upon the splanchnics would give relief. That was a case where the patient was easily susceptible to congestion of the stomach, and such treatment, coupled with treatment of the vagi in the neck, would always give relief. Treat in general the back from the third or fourth dorsal down to the tenth, eleventh, or twelfth. Displacement of ribs may cause the same trouble, and you may also find a contracture along the spine on either side, which will cause trouble with the stomach. I treated a case some time ago in which the only lesion I could find was a contracture of the muscles on both sides; there was a little heaviness of the stomach, which disappeared on treatment. You may find exquisite tenderness over the region of the stomach, and you can see on pressure whether or not that be nervous or inflammatory. When you have gas in the stomach it shows there is a lack of life in such a way as to allow the food not to be digested and passed on in the usual way, but to be retained and thus to ferment and form gas. It is said to free the stomach of its contents, to inhibit the pneumogastric between the fourth and fifth ribs, as I have shown you, and in that way you relax the pylorus and allow the food and contents to pass off.* Or you can also do the same thing by mechanical work. I thrust my hand down upon the left ribs and work toward the large end of the stomach; I bring pressure gradually toward the pyloric end, in that way you can force onward the contents of the stomach. You work thus over the ribs; you can press the ribs down, and you can also, in the median line, work very carefully on the abdomen; you thus work the gas or liquid from the stomach.

This deep pressure over the solar plexus, as I have already shown, is said to be very efficient in case of bloating with gas. In some way the stimulation of the plexus allows the gases to be condensed. The ninth and twelfth ribs on the left side have been found displaced in some cases. In cases of pregnancy, difficult menstruation or such troubles, you will frequently find a sick stomach. That is reflex. To treat a sick headache which is caused from the stomach, you must first apply your treatment to the stomach, and thoroughly stimulate the parts there before attempting to work on the head. In case of

*See Appendix 18.

female troubles, you may give relief there, and it is well to do so, but of course you must work upon the local trouble at its appropriate centers to relieve it.

Now, as to the LIVER. First, its examination; you cannot see anything by mere inspection; the best way is to *percuss* the region of the liver. If you find behind the linea alba that the left lobe comes down as much as three inches, the liver is either prolapsed or enlarged, and you will have to determine which is the case. By percussion along the lower edge of the ribs, and up over the ribs as high as about an inch below the nipple you can make out the outline of the liver. You will also frequently find that it is quite tender, and it becomes extremely so in some cases. Dr. Harry Still says that in case the liver is extremely tender he always looks for diarrhea alternating with constipation. The easiest place to find whether or not the liver is tender is in the median line behind the linea alba. Of course the liver is complicated with general troubles, as, for instance, in constipation and diarrhœa; these two things indicate derangement of the liver. In diseases of the liver you will frequently notice yellow splotches upon the skin, perhaps on the face, perhaps over the abdomen; you will find a rushing of blood to the head, double vision, or day blindness. You must learn in general what the complications are, when the liver is deranged.

I have noted the fact that *auscultation* is frequently used in examination of the liver. Just place the ear very lightly over the region of the liver, at the edge of the liver you will be able to make out a gurgling if there be such there. Now, as to the treatment of the liver itself. I have already shown you how we treat it—the raising of the ribs as shown; or have the patient take a deep inspiration, and then raise the points of the ribs upon expiration. Dr. Harry Still frequently employs that method—reaching under the tips of the ribs and raising them upward and outward. Of course you will have to be careful in doing that. We also work upon the liver frequently in this way: you can place one hand beneath and thus raise the side of the chest toward you, and with the other hand press down with the flat of the fingers against the liver. Thus you can press the ribs down, and this motion is very good.

I explained what I believed to be the theory of such work the other day. In treating the liver we must remember that there are vaso-motor fibres in the pneumogastric, and we must not omit to treat it. We also treat the splanchnics, as they contain the sympathetic supply; also the solar plexus. Those are the chief points for reaching the blood and nerve supply of the liver. Also the point that I gave you, upon each side of the umbilicus, it is said that pressure here applied not too deeply, a fairly firm pressure, will reach those centers and influence,

first, the kidneys; second, the liver; and third, the bowels. You can get an influence upon all those organs in that way.

The GALL-BLADDER AND DUCT are extremely important to us. As I have said, the gall-bladder is behind a portion of the liver at the point of the ninth rib on the right, but we can get indirect pressure upon it by working up under the point of the ribs; for instance, you can sometimes feel the prominence made by the fundus. The first thing in working upon the gall-bladder is to work against the fundus, and we can work upon it by working up under the ends of the ribs. The duct we have already spoken of, it lies upon the right in a reversed "S," its upper limb being just over the umbilicus, to the left, and the lower limb of the "S" around the umbilicus to the right where it empties into the duodenum. Since the gall-bladder and its ducts are lined with mucous membrane, and since, like mucous membranes in other parts of the body, it is liable to catarrh, it follows that catarrhal inflammation may sometimes travel from the pharynx, through the œsophagus, stomach and intestines and up into the gall-bladder. You will then have an increased secretion of mucous in the gall-bladder and duct, and may have a mucous plug shutting up that duct, resulting in jaundice. Or you may have a gall-stone formed, said to be a precipitation of the cholesterine of the bile; this solidifies and closes the duct. In treating for gall-stones we work as I have shown you, against the fundus of the bladder and along the duct, simply trying to force them out. Sometimes they are quite hard, and at times they are quite soft and can be crushed in the duct; this has to be done without any violence, however. It is said that in treating for gall-stones, you should not end your treatment without raising the ninth, tenth and eleventh ribs on the left side for the spleen; that stimulation of the spleen seems to prevent their formation, and results gotten there seem to prove that argument.

Q. In case you were treating the vagi in the neck and the patient should be taken with a nervous chill or something of that kind, at what point would you treat to counteract that?

A. I would treat along the spine, a general treatment, stimulating also the heart and lungs to stimulate the circulation.

LECTURE XXV.

At the last lecture I took up the examination and treatment of the abdomen and its contents, first showing you how we treat to affect the abdomen in a general way, and then I started to take up the contents of the abdomen one after another. I will also take up the consideration of the pelvis to-day.

I. SOME NERVE CONNECTIONS AND CENTERS FOR THE INTESTINES AND PELVIC CONTENTS.—I have already mentioned some centers, in the list given, and we should always consider those centers along the spine in connection with the different parts. There are certain vaso-motor fibres noted in Howell's Text Book; First, for the external genital organs there are two groups, one coming from the lumbar region, and the other from the sacral region. Those of the lumbar, from the second, third, fourth and fifth lumbar nerves, running forward in the white rami communicantes. They pass through the pelvic plexus and pudic nerve and thus reach their termination. You will see later that this pudic nerve is important to us in our treatment; you know it contains some vaso-motor fibres for the external genitals. As for the sacral group, these leave the anterior roots of the nerves in the sacral region. A stimulation here causes a dilation of the vessels of the external genitals. As to the internal generative organs, vaso-constrictors for the Fallopian tubes, uterus, and vagina in the female, and for the seminal vesicles and the vasa deferentia in the male, are contained in the sacral nerves. Also we get some fibres from the second, third, fourth and fifth lumbar nerves, just as we had vaso-motor fibres for the external genitals. We need to know the following points: That the second, third, fourth and fifth are the same for the external and internal genitals; that we get vaso-motor fibres from both; that we also work, as you will see later, in consideration of the pelvic contents, frequently upon the sacral region, springing the sacrum, relaxing the ligaments about it, and also stimulating the peripheral terminations of the nerves in the muscles along the sacral region. It is said that the first point to which one should go in treatment of female troubles is the fifth lumbar; that that is the important point, not particularly an important center, but the place where it seems a displacement is likely to occur. Then, too, you know that that is the center for the hypogastric plexus. The next important point is the second lumbar, which is the center for blood-supply to the uterus. After that, in treatment of female troubles, the next important point is between the tenth and eleventh dorsal vertebræ, the blood-supply to the ovaries.

Hilton makes a point that the muscular abdominal walls, the peritoneum lining these walls, and the skin over them, are supplied by branches of the same nerves, as we have already mentioned the point he makes that a joint, the muscles moving the joint, and the skin covering those muscles, are all supplied by branches of the same nerve. Hence, it is, he says, that retraction of the abdominal wall and great tenderness of the skin over the abdomen is found in cases of peritonitis, the inflammation reaching the terminal filament in the peritoneum, extending thus from the branches irritated, the sensory branches

to the motor branches, causing the abdominal walls to contract, influencing also the external cutaneous branches, resulting in a feeling of pain upon touching the abdomen. That brings to mind the point that has already been mentioned, and which was brought up in clinics not long since. The question was, can you impinge upon the sensory part of a nerve and thus affect its motor fibres. I think that such points as this answer that very clearly. Hilton also instances a case of peritonitis, in which the cause was obscure. It was not severe, but it was hard to tell at first that it was peritonitis. The patient had been having pain in the abdomen, it was bilateral, there was no heat at the part; he therefore decided that the cause was either central or double, and since there was no heat there, he examined for spinal trouble. He could not find any evidence of disease of the spine; he then made his examination for fluid in the abdominal cavity and found that there was fluid irritating the nerves and causing this pain upon the abdomen.

In considering the pelvis, I thought it would be interesting to bring out some further points considering nerve connections there. I noted the point the other day that in disease of the uterus, ovaries, etc., the sympathetic filaments supplying these parts carry the irritation back to the spinal nerves, and thus it may go down the sciatic, or may influence the muscles at the lower part of the spine, causing lameness there. A further point is noted with considerable interest, and it may be useful to us in many cases. Hilton noted a case in which a gentleman came to him with what he supposed to be trouble of the bladder and urethra. He had pain externally in the genitals on one side, and he traced the pain very definitely along the peripheral branch of the pudic nerve, along the ramus of the pubis and ischium to the genitals. Hilton traced the nerve carefully back and discovered at the tuberosity of the ischium on the side affected a thickening of the tissues. The gentleman had been used to sitting upon a hard, uneven seat, and gradually there had formed a thickening of the tissues which had impinged upon the nerves and caused this pain. As you know, there is a bursa over the tuberosity of the ischium for its protection, and irritation, or sitting upon a hard seat, or weight unevenly distributed, will cause similar troubles. It may be an Osteopath would go back to the spine, but if he did not find a lesion there the next best thing would be to go to the nerve, and see, especially at the tuberosities, if there was not some trouble.

II. LANDMARKS ABOUT THE PELVIS AND PERINEUM:—

You are all familiar with the location of the *anterior superior spine* of the ilium. It is used by surgeons as a point from which to measure the length of the limbs, which you know is quite a hard thing to do successfully, so many things make changes in the length of the leg. Holden, however, says he finds it more reliable to take a tape line and have the

patient hold it between his teeth, then measure a fixed point on the limb somewhere, (he measures to the inner malleolus) not swinging the tape from one side to the other, but making an independent measurement each time. You will find that in work upon the pelvis, and in examining the legs you will have to see that the patient lies perfectly straight upon the table. One good way is to ascertain whether or not a line drawn transversely between the anterior superior spines is at right angles to the axis of the body; you will have to see that the patient is perfectly straight. It is also helpful in making a diagnosis of hip-joint disease, or disease about the hip-joint, to place the thumbs firmly upon the spines, one upon each, then grasp beneath the trochanters with the finger, and you will be able to examine in that way for two things; whether the two sides are alike, and at the same time you can press backward upon the spine; a tenderness behind gives evidence of disease in the sacro-iliac synchondrosis.

The *spine of the pubis* is also familiar to you in its location. It is not always easy to find; sometimes you can find it by pushing the lower abdominal skin backward toward the direction of the spine; if not successful, then by abducting the limb slightly, causing the adductor longus to be tensed; you can feel its attachment to the spine. Frequently it is difficult to distinguish between two kinds of hernia, the inguinal and femoral, but is said that in case of inguinal hernia the spine of the pubis is on the outside of the neck of the sack, while in case of femoral hernia it is on the inside. That may be a helpful point.

The *perineum* has a ligamentous and osseous boundary; it is bounded by the rami of the pubes and ischia, the tuberosities of the ischia, the great sacro-sciatic ligaments, and the tip of the coccyx behind. It is important in our practice, I have not seen the point mentioned in the books, that we should note the shape of the perineum. In the normal, healthy perineum there is a slight bowing upward to hold up the pelvic contents. In disease there may be a relaxation of the perineum and a dropping down of the contents, causing a bulging of the perineum. Of course the bulging is slight whether it is normal or abnormal, but it is important; those things sometimes cause a great deal of trouble, even though the variation from the normal position may be slight. In treating such a case we go to the pudic nerve where it crosses the spine of the ischium, stimulating just where it crosses the spine, and its perineal branches running to the perineum cause a contraction; also by stimulating the lower sacral nerves, causing a contraction of the coccygeus muscle, we help it to raise the bowel and the pelvic contents.

Along the region of the sacrum we find the *posterior superior spines* of the ilia. They are on a line which would pass horizontally through the second sacral spine, and they also mark the middle point of the sacro-

iliac synchondrosis. We can find opposite them the spines of the sacrum, down to the last, and two tubercles upon the last just where it ends. The third sacral spine it is said is the limit of the extent of the membranes of the cord in the spinal canal and of the presence of the cerebro-spinal fluid in the canal.

The *prominence of the gluteal* muscles often becomes significant. That is, it is said that in persons of ill health these muscles become relaxed and flaccid, and that wasting upon one side is an early symptom of hip-joint disease, which is very difficult to diagnose. The *fold of the buttock* is the name given to the line below the edge of the gluteus maximus muscle, between it and the upper back part of the thigh, and it is said that in this fold is the easiest place to bring pressure upon the great sciatic nerve. Taking a point between the trochanter and the tuberosity of the ischium, and pressing deeply, rather nearer the tuberosity than the trochanter, you can impinge upon the nerve. Often a person sitting sidewise will have the leg become numb because of impingement upon the nerve; you may sit upon the edge of a bench and injure this nerve so as to cause sciatica.

A line drawn from the posterior superior spine of the ischium to the top of the trochanter, when the thigh is rotated forward, marks, at the junction of the upper with the middle two-thirds, the emergence of the *gluteal artery* from the great sacro-sciatic notch, and it is at that point that you can determine the top of the notch. The *pudic nerve and artery*, as you know, both cross the spine of the ischium. This is located by drawing a line from the same point, the posterior superior spine of the ischium, to the outer side of the tuberosity of the ischium, then taking the junction of its outer and middle thirds, you have where this vessel crosses the spine, and there you can impinge upon it. The nerve accompanies the artery, and that is an important point to the Osteopath, for there you can stimulate that nerve and cause contraction of the perineum. The point is mentioned that modern methods of sitting, enjoying one's self in an easy chair, or upon soft cushions and the like, causes the parts to be supported more by the soft parts about the hips, so that pressure could thus be brought upon these blood vessels, especially the pudic, and that a hard chair is much more healthful. Upon the condition of these nerves depends the blood supply to the interior pelvic organs. Pressure, brought by sitting, upon these vessels determines the flow into the pelvis and is a fruitful source of uterine and pelvic disorders.

III. EXAMINATION AND TREATMENT OF ABDOMINAL CONTENTS.—(*Continued.*)—As to how to diagnose troubles of the intestine, you will learn that better in symptomatology, when you come to the special diseases. However, I can show you something of the methods em-

ployed. It is obvious that when you have a case of constipation, diarrhoea, flux or anything of that kind, where the trouble is. The nerve supply for the intestine, as you know, is through the sympathetics from the upper dorsal down; that is, from the third dorsal down, because we get the vaso-motors to the mesenteric vessels from the splanchnics, and we reach the sympathetic connection all the way down the spine. I have already shown you how to treat those parts. We also reach it by working on the solar plexus, and you can get an immediate effect by working upon the centers either side of the umbilicus. In all these ways we may reach the intestine. *Stimulation of the sympathetics will inhibit the vermicular motion of the bowels, while stimulation of the pneumogastric will increase the motion. You know that in working upon the region of the intestines we also work upon Auerbach's and Meissner's plexuses. There is a treatment that we use sometimes in case of constipation, or other trouble with the bowels, that is, we begin at the left iliac fossa, and by deep pressure over the line of the colon, work gradually upward along the left lumbar region where the intestine runs over the kidney, then across just above the umbilicus, and down the right lumbar region; that is, we work there largely for mechanical effect, to soften the fecal matter and work it outward as we go, beginning near the orifice. Of course, it is impossible not to impinge upon the nerve plexuses and not to influence Auerbach's and Meissner's plexuses in working upon the intestines. You will very frequently meet cases of *cramps and diarrhoea*. They are not limited to particular seasons of the year. I have found cases of bad cramps in the intestines where it was almost periodic, you might say, it came on every two or three months. After some indiscretion, as over-eating or eating of too rich food the patient would have those attacks. The spasm, as near as I could make out, is most liable to occur in the transverse colon; it starts there first, and from that point the irritation will pass down through the bowel, and the next morning or the second morning you will have tenderness and pain down in the region of the right iliac fossa. It has been my experience that it takes that course; from there it will spread over the bowel, and you will have an inflammation, as shown by the fact that the patient usually passes mucous upon convalescence. This trouble can be very readily stopped. It is done by inhibiting the splanchnics; you can have the patient sit upon a chair, and hold closely all along the region of the splanchnics, by a deep pressure, hold at each point for a minute or two and you will be able in that way to stop the spasm. I have seen it disappear in a very short time. The same thing can be done by placing one knee along the splanchnics and drawing the arms up and back. That brings deep pressure, and very forcible, against the splanchnics, and in-

*See Appendix 19.

hibits them. Particularly it is the upper splanchnics we wish to reach, but it does no harm to work on down the spine. It is not a bad idea to adopt a twisting motion, because if there is a tightening and irritation of those nerves, you will be able to relax them in that way, and I have been able, in that way, to get very good results with such trouble.

There is another thing that comes to us very commonly, and that is *flux and diarrhoea*. The center for the bowels which we wish to reach in such cases is opposite the lower two ribs on each side, where we work by inhibiting, by getting deep pressure, just as I have shown you. Have the patient sitting up, and you can place your knee against the eleventh and twelfth ribs, close to the spine on one side, and pull the arms up and back, and then against the other side; you can thus inhibit the peristalsis. It is undoubtedly through the sympathetic connection and inhibition of the sympathetics. I never omit in such cases to spring the spine, and to spring it strongly; that is one of the cases where we have to give a strong treatment, so I have the patient on the side, reach under the spine and spring the column toward me strongly, all along the lumbar region. It is very helpful also to adopt this method in such cases: with the patient upon his side, have the thighs bent up, get a good hold against the sacro-iliac articulation, and spring enough to raise the patient from the table. I think you can see from the motions I have given you about what you can do in such cases. Also in such cases never forget to work upon the liver; I have already shown you how to reach that, and influence it, especially the flow of the bile. It does not make much difference whether the patient is constipated or whether he has flux or diarrhoea, the presence of bile in the intestines is undoubtedly helpful. In cases of constipation, Doctor Still says the bile is Nature's aperient, and that it helps to stimulate the peristalsis. In the other case the action of the bile in the intestine seems to be such as to allay the irritation or the inflammation. It amounts to restoring the normal; in one case you have a lack of bile, and the normal action of the bowel seems to be dependent upon it for stimulation. In the other case you must work to cause a flow of bile also. Just why it works differently it is very hard to explain, unless, as I say, it is the normal condition of the bowel to have the bile present at certain intervals, and if that bile is lacking, you may have various effects. I had a very interesting case not long since, a gentleman who some years ago, I think about three, had a case of bowel trouble, diarrhoea and considerable trouble at that time. Since then he had had pain after eating, about three hours after a meal, also bloody flux. This had been troubling him off and on ever since he had the old trouble. Upon examination the only difficulty that I could find was tightening along the lower lumbar region, making a smooth place in the spine, which I have already described to you. Besides that, the eleventh and

twelfth ribs on each side were approximated, so that you could feel but very little interspace between them. In the first treatment I did all I could to spring the lower part of the spine and to relax the tissues in that region, and also adopted motions already shown to separate the eleventh and twelfth ribs. After that treatment the pain after eating ceased, and he did not have any return of it. The next treatment was given about a week later, and I repeated the same process at that time. Since then, at the last information about a week ago, he had had no return of the trouble, and that was about two weeks after the treatment. Now, that was all very simple, it was merely looking to see where things had departed from the normal, and restoring them and relieving the tension upon the parts. One thing that I did in that case was to relax the ligaments by springing the lumbar region. You will learn these motions and how to apply them. It seems that in same kinds of trouble one motion is more efficacious than another, and you will also find that it varies with your patient. I also, in that case, took what I call the quarter turn to relax the tension between those ribs. That is, I took the legs of the patient in my arms, and turned him until his body was about three quarters off the table, then let him slip down and around, lifting him back onto the table, straightening the legs.

I mentioned the point that a displaced coccyx is sometimes the cause of diarrhea. There is also another important treatment in the case of intestinal troubles. That is, you may raise the intestines almost bodily, especially in cases where there is a relaxation of the abdominal walls, where you find the transverse colon descended below the umbilicus, and then by pushing in deeply above the pubes you can push upward and outward and thus raise the abdominal contents. Another motion is to have the patient lie on the side and then you, standing behind him, reach deeply into the fossa and work in on the right side under the caecum, follow it up and spread, and then work in the same way on the left to raise and spread out the sigmoid flexure. That is frequently a very good way in which to treat troubles of the intestine, especially where you expect any sort of relaxation allowing the bowel to drop in that way, and that is in almost every case where you have had intestinal trouble that has been going on for some time. There is almost always a relaxation of those ligaments, and prolapse of the bowel. You will remember that the defecation center is at the second lumbar, and Doctor Still has shown me a good point in how to reach the second lumbar. He places the thumb of one hand just over the trochanter of the femur, or just above, and then finds the second lumbar by counting carefully up from the fifth lumbar, then, while he presses upward the trochanter of the patient with the hand that is on the hip, he presses inward with the other hand and gives a turn to the second lumbar. Then, taking the same point for one hand,

and reaching under and raising the patient's head and shoulders, he thus very effectually relaxes the second lumbar. You see, that makes the second lumbar a fixed point, and you swing the upper part of the trunk around it.

Robinson makes quite a point of the fact that what he calls the fecal reservoir, viz.: the left half of the transverse colon and the descending colon and the sigmoid flexure, are all supplied by the inferior mesenteric ganglion. This inferior mesenteric ganglion is found on the inferior mesenteric artery, and you can reach it by working a little toward the left about two inches below the umbilicus. We have very good results in cases of constipation by working there and stimulating that plexus; the inferior mesenteric ganglion of the sympathetic.

In speaking of the use of bile it is not only helpful in cases of diarrhea, flux and constipation, but that is our way of destroying entozoa, tape worms, or seat worms, or parasites of any kind. It is said it is always beneficial to stimulate the flow of bile in such cases, and very frequently that is all that is necessary, thus causing the worm or parasite to be acted upon by the bile. In treatment of constipation you will frequently find that the patient is in trouble because he has not drank enough water, and that is why very frequently it is necessary to prescribe so many glasses of water in a day, you can say mineral water or spring water, or something of that kind, so they will think you are particular about it. It is said that the explanation of why drinking of water is beneficial in cases of constipation, is that when the stomach is empty (the water should be used one half hour before breakfast) that the water passes into the intestine, is easily absorbed by the lacteals and carried to the portal circulation. That stimulates the flow of bile, and increases its quantity, and thus it affects the fecal contents.

As to the treatment of the SPLEEN, I have already shown you that. You will find that there is a tenderness along the spine behind, and in front along the region of the ninth, tenth and eleventh ribs on the left side in such cases, and Dr. Harry Still tells me that in such cases it has been his experience to find a cold, clammy perspiration, especially on the left side of the body. What we do there I have explained, raise the ninth, tenth and eleventh ribs, and work carefully under the tips of the lowest ribs in front. As I explained at the last lecture, the vaso-motor supply of the spleen is not understood, but it was stated that we changed its size by work upon the peripheral terminals of the splanchnics. It is understood also that there is a center in the medulla. There is also a center in the medulla for the intestines, and it seems that some trouble with the atlas, or some tightening of the ligaments may impinge upon the sympathetics and thus get an effect either through the medulla or directly through the sympathetic system.

LECTURE XXVI.

At the last lecture I was following the subject of examination and treatment of the abdominal contents. I shall pursue that subject further to-day, taking up also the pelvis, its examination and treatment, particularly with regard to slips or twists of the pelvis as a whole and of the innominate bones. We had gotten as far as to the KIDNEYS. To treat the subject in a general way we can only say that where there is trouble with the kidneys there is a tenderness in the back; frequently contractures or displacements along the spine. There are general symptoms which you will learn to recognize, and which you will find by urinalysis, which you have learned elsewhere. Also such things as odor of the breath, and condition of the tongue; it is said that a furrowed or ridged tongue indicates kidney disease. The complexion, and various things, are indications of kidney disease; also fever, as in suppression of the urine, since then the system is poisoned. Often you have painful micturition due to bladder or kidney disease, and so on. The chief thing, however, is how we, as Osteopaths, treat the kidney. The nerve supply is largely through the renal splanchnics, the last splanchnic rising opposite the twelfth dorsal. I have shown you how we should work there. Also the second lumbar is the center for micturition, and the effect that we get by working upon the second lumbar is probably a vaso-motor effect, since you know that vaso-motors leave the spine all the way down, especially from the sixth dorsal to the second lumbar, having both vaso-dilators and vaso-constrictors within those limits. A lesion at the atlas also affects the kidneys, probably by an affect upon the renal center in the medulla. Hence, we always examine to find whether or not the atlas is displaced, and if not, we are able to get an effect upon the renal center in the medulla by working on the superior ganglion, and in the sub-occipital fossa. Hence, we get a sympathetic effect. Now, a lesion in the cervical region, especially at the upper part, at the atlas, may affect the kidney directly through the sympathetics, and indirectly through the center in the medulla.

One of the best ways to treat the kidneys is the method employed by Dr. Harry Still; have the patient upon the back, with the knees flexed; you then have all the muscles relaxed. Then by lifting along in the region of the lower splanchnics, simply raising the patient upon the fingers and springing outward as you go, you relax the contractions, spring the ligaments, and get a general stimulating effect upon the kidneys. You will find that, I think, one of the best treatments. Another treatment is to press at the umbilicus, and by pressing deeply, spreading and stimulating probably the sympathetic ganglia upon the renal vessel, as there the renal ganglia occur. Also the centers which I have before mentioned, occurring one on either side of the umbilicus below the skin, called peritoneal cen-

ters, have an effect upon the kidneys, and I do not doubt that we get some sort of a mechanical effect also in this way, by relieving any pressure which may be upon the renal vessels. There are other things that may bring mechanical pressure upon the renal vessels, such as aneurism of the abdominal aorta, an enlargement of some one of the abdominal organs, or tumors, and in those cases you must direct your treatment to the conditions which are producing the disease.

You will frequently meet cases of renal colic, that is, stone in the kidney or in the bladder, and in the passage of the stone down the ureter the pain is excruciating. Renal colic is the name given to the pain caused by the passage of the stone. The deposit varies, sometimes the stone is large, and it varies in composition. I do not need to go into that, as such is not the purpose of this lecture; sometimes it is a crystal of uric acid about which deposits aggregate. As to the proper treatment for it, when a stone is started from the pelvis of the kidney down the ureter, it is our treatment to work along the course of the ureter and to work it back, if possible, because you can dissolve it as well in the kidney as you can if you press it on down to the bladder. If it has started on down the ureter and cannot be worked back, it should be worked on down into the bladder. You know what the course of the ureter is, from about the level of the umbilicus, a couple of inches each side, down obliquely to the base of the bladder. I do not mean to say that you can feel the ureter by working along its course. You can, however, bring deep pressure along its course, and thus work upon any stone which may be in it. That is frequently done. In such cases our treatment would be directed to stimulating the general health of the kidneys, that is, to increase its healthy action, so that these stones could not be formed. If your kidney is acting properly you will not have renal calculus. Not only would we take care of the renal splanchnics, and the second lumbar, but of all the lumbar and lower dorsal region. I have tried to teach you that your lesion may be at the center, but it may be above or below, causing trouble with the kidneys. In general our success with kidney troubles has been very good. When you come to general treatment, drinking of hot water, bathing, and exercises are all good. There are some who believe that it is beneficial to, as they call it, flush the kidney every morning, by taking a drink of water before breakfast. That acts upon the kidneys as well as the bowel. It is probable that the increased excretion would tend to keep the kidneys flushed. Byron Robinson notes that fact, but does not give it the weight of his authority.

As to examination and treatment of the PELVIS, that is an important thing in our work. The pelvis or the innominate bone may be slipped in different directions, and the correction of these slips gives the Osteopath very gratifying results indeed. The whole pelvis may be slipped

forward or it may be tipped backward, or the whole pelvis may be twisted to one side, and you would have tenderness on each side at the sacro-iliac synchondrosis particularly. You will also have tenderness at the symphysis, for the reason that the sacrum is broader in front than behind, and movement of the parts would tend to cause the wedge-shaped sacrum to act upon the innominate bones and to press them apart, thus you would have a strain at the symphysis, and you would also have tenderness here. In examining for these troubles, always pay attention to the symphysis. You would always have tenderness where the ligaments bind the back part of the sacrum to the innominate bones. If the pelvis is tilted backward, your hand, when it has become able by touch to detect the departure from the normal, will find that the posterior portions of the crests of the ilia are projecting farther back, and when tilted forward, that the posterior portions of the crests are tilted farther forward, so that you will find out whether the position is correct when you examine by palpation, which is our general method. Now, if the pelvis is twisted from side to side, you would find a tenderness on each side at the sacro-iliac articulation, as well as a tenderness in front at the symphysis, and you will have to judge which is the case. If the pelvis is twisted you can, by examining the back, get an indication of which way it is twisted. It will take very close work in examination, and you have to give it your careful attention. The reason why you would have tenderness on each side is that in a twist of the pelvis from side to side you would have both ligaments thrown on a strain, one diagonally backward, and one diagonally forward, and you would get tenderness in each case. When you have these slips and twists, you have something then that is affecting the sacral plexus of nerves, and the result may be pain down the legs, or you may have sciatica in one or both limbs. The most fruitful source of pelvic disorders, especially of female troubles, is a slip of the innominate, as you will see later. So your examination would include both the symphysis in front, and the articulations behind, coupled with an examination for general disorders of the pelvis, and even down into the limbs.

Now, as to how to treat the pelvis if it is tilted forward. One of the best ways is to set the patient on a chair, and then by putting the knee in the sacrum behind, we can reach in front, get hold of the anterior superior spines, and pull backward; it does not take a great deal of force, and at the time it is quite a good movement to pull the patient forward. If the pelvis is twisted, then the lower part of the body in respect to the waist is turned to one side or the other. One of the best ways to fix that is to set the patient on a chair and place his arms up over your shoulder, then twist to one side or the other, making an effort to move the whole trunk of the body upon the articulation with the pelvis, and that is rather a movable point, and often the

point of displacement, you can readily turn it from side to side. You can also move the whole pelvis forward by some such motion as this: have the patient lying upon his side, you, standing behind, can make a fixed point with one hand against the back of the sacrum, and can pull the limbs backward; that would be when the pelvis was tilted backward. Or, you can place your knee against the back, and pull back on one side and then on the other with the patient lying upon his side on the table, or sitting in the chair. Some will prefer that method perhaps. One of the best ways to move the pelvis, with the patient on his back, is to bend your hand, place it under the sacro-iliac articulation, and then flex the thigh, and pull the knee down, out and around quite strongly, thus relaxing the ligaments of the articulation. That should be done upon one side and then upon the other. Our experience and practice has taught us this one thing: that ligaments are extremely important. You may have a cold, and the effect upon the ligaments will be to contract them, and you will have luxations of the parts affected, from that simple fact. You may have dislocations of the pelvis or of one of the innominate bones.

I had quite a remarkable case the other day—there was almost complete paralysis of the lower limbs. The patient went about in a chair. That had all been brought on by la grippe, and the whole body had ceased to grow, the arms were thin and small, the face and head were normal, and you got the impression of looking at a dwarf. So it is that a cold, light or severe, may act upon the ligaments and contract them and thus cause a luxation of the parts, and there is no doubt that is frequently the cause of displacement of the pelvis as of other parts.

Now, not only may the whole pelvis move one way or the other, but one innominate bone may move one way or the other. That is, the whole bone may be slipped up or down, or it may be tilted backward or forward. However, when the bone is tilted forward, you will see that it almost inevitably goes somewhat upward on account of the shape of the articulation with the sacrum. From that fact, since when it is tilted somewhat forward, and at the same time has a tendency to slip up along the back part of the articulation, it will have the effect of shortening the leg. Consequently when the innominate, not the pelvis as a whole, is slipped forward, you might have a shortening of the leg. Naturally you would suppose that a slipping forward of the pelvis would lengthen the leg, but you can see from what I have said that such is not likely to be the fact. That would change the normal axis of the parts. The various axes are made by junction of the sacrum and ilium by means of ligaments, and when the innominate bone is moved in one direction one point will be fixed and act as an axis, while another point will be fixed and act as an axis in another position of the innominate bone.

That subject has not been thoroughly studied out, but it is a fact that when the innominate is slipped forward then you have a shortened leg, and when backward you will probably have a lengthened leg. Dr. Harry Still is authority for the statement that a twisted or tilted innominate may shorten a leg as much as three inches. A novice looking at such a condition would think at once that the hip was dislocated, but it is not always the case, and you must be careful in your examination. One of the first things in examination is to make these motions of the thigh, flexion, extension, adduction, abduction, and circumduction, for the purpose of relaxing all unnatural tension about the leg, so that you can tell whether or not the limbs are similar. Then, placing the patient straight upon the table, which you will have to by accuracy of your eye, you can judge whether or not a line drawn between the anterior superior spines of the ilia is at right angles to the direction of the body. Then you will, by taking a certain point, preferably the bottom of the heels, or just where the seam runs around above the heel of the shoe, note whether the limbs are of the same length. You will have to notice any variation in the thickness of the heel; some people have a thickened heel or sole put on their shoes for the very reason that their limb is a little shorter, though quite as frequently the condition has not been discovered. When you have pain in the lumbar region of the back, pain in the hip, or in the leg, or in the sacral region, or in the external genitals, you will do well to examine to see if the limbs are of the same length, and if such is not the case you may continue the examination further by looking to see whether or not the pelvis or one of the innominates is displaced.

When measuring one leg by the other you have a variable standard, it is hard to tell whether or not one leg is longer than it ought to be, or shorter. So you have to take means of determining which is the affected side. It is well to go to the sacral articulations, where there will be soreness on the side affected, because a greater strain has come upon the ligaments there, and you will also have a soreness on the symphysis pubes. You will frequently have a tension and some tenderness from contraction of the muscles, on the opposite side from the one affected. Taking this left one as the one affected, then you might have a contracture and some tenderness on the right side, because when you have one thrown out of position, then you have the equilibrium destroyed. There has to be accommodation of the parts, and there will be tension there on that account, but I think the rule given you will indicate to you which is the side affected.

As to how we may remedy the defect of one innominate being slipped, there are various ways; some are the same as I have shown you. As I have said, the motion employed, by flexing the thigh

against the thorax, placing the hand firmly under the pelvis, and pushing the knee outward and down, thus straightening the leg again, is one of the best methods. After you have done that, it is well to give the leg a straight pull, not a jerk. You thus bring tension upon the ligaments, and in that way frequently straighten mechanically, and I think you get a certain nervous effect that will relax the spasm. It is like putting your hand upon a contracture and gently pulling against the contracture until you have relaxed it, so it is with the limb, you can relax the spasm of the muscles, you can restore the equilibrium of nerve force, and it will return to normal. That is one way; another is for the operator to stand in front with the patient upon his side, then, by reaching under the upper limb and grasping the tuberosity below, while the other hand grasps the anterior superior spine above, you can move it in either way very readily; you can slip the innominate forward or backward. That is one of the best ways. You can in that way stand in front of your patient and do your work. You can stand behind the patient, use the knee as a fixed point against the sacrum, and then, holding against the anterior superior spine, work it backward. When you stand behind, the idea is that you can work to draw the anterior spine toward you. Also you can stand behind the patient, one arm beneath the thigh of the patient, making a fixed point of your other hand against the sacrum, then bend the leg back until you have it drawn back to a considerable extent, varying the degree of tension according to the patient. That is one very good way to force the bone forward. Pressure upon the sacrum is very frequently employed; it is one of Dr. Hildreth's very common treatments. In a great many cases of treatment along the lower part of the spine he will finish by putting his knee against the sacrum and bringing it inward against the patient, while he draws the pelvis of the patient back towards him. The idea being to relax the ligaments and to take off the tension which is thus brought upon the branches of the sacral plexus. From what I have said and from combinations that your own ingenuity will suggest to you, you can remedy the defect when the innominate is slipped upward or downward. You might set the patient upon a chair and lift upward, at the same time having an assistant push downward upon the crest of the innominate affected. One point that you might notice in regard to affecting the innominate is the fact that the quadratus lumborum has a tendency to increase the lesion by its contracture, and in relaxing the tension about the innominates when displaced, you would do well to stretch the quadratus lumborum. That I have shown before; give it the diagonal stretch this way once or twice and once or twice the other way; you can do that better with an assistant, because you can get a better tension. I think this shows the value of steady, firm work over the body. The idea

of working with jerks is bad, because as a rule, when you exert traction or pressure, the idea is that you are relaxing, it is in the nature of inhibition of nerve force, and if you go at it with a jerk, you are not only liable to stimulate instead of inhibit, but to thus set up a firmer contraction, whereas you wish to relax.

In treating the pelvis, I have noted the point that you can work upon the spine of the ischium, thus impinging directly upon the pudic nerve. I have indicated how you should find that point by a line drawn from the posterior spine of the ilium to the outer side of the tuberosity, the junction of the lower with the middle third of the line will be the point where you can best impinge upon the pudic nerve, and then by relaxing the glutei muscles by drawing the limb backward some, you can get deep pressure at that point, and thus stimulate or bring pressure and inhibition upon the nerve. The effect of that is to work upon the perineal branches, and draw them to cause contraction of the perineum itself.

As to the BLADDER, the point at which we reach the hypogastric plexus, supplying the fundus of the bladder, is at the fifth lumbar. And then along the sacral region we get some motor fibres to the bladder. Along the lumbar region, according to Quain, we get motor fibers, particularly to the circular muscle fibers of the bladder, including the sphincter. He says there are probably also, to aid those fibers, inhibitors to the longitudinal fibers. Thus, work along the lumbar region would affect the bladder. An inhibitory effect would be to relax those circular fibers, and a stimulating effect would be to contract the circular fibers. In the sacral region the Osteopath takes as his center, the third and fourth sacral, and he works there to relax the sphincter of the bladder. It is stated by Howell's Text Book that stimulation in that region causes contraction of the circular muscle fibers. It has been our practice that by inhibiting in that region we got the effect of inhibiting these fibers and relaxing the sphincter. It is stated by Howell's Text Book that in the sacral region and in the lumbar region there are no vaso-motor fibers given off to the blood vessels of the bladder.

As to how to examine the BLADDER, you know where the bladder is situated; when distended, it will rise above the pubes, and you will likely find it by the tumor, and on percussion you will get the flat sound from the contained fluid, so that will be part of your examination. But the general symptoms which you will get, particularly in symptomatology and in urinalysis, will direct you in your examination of the bladder. If you have a case of ammoniacal urine you will be able to recognize the crystals under the glass, and to tell whether there is trouble with the bladder. You will note the presence of bacteria, setting up a decomposition in the urine. Several months ago I examined a sample of urine under the glass; it was freshly drawn and was crowded

with bacteria. I directed the operator who brought the sample to boil the bottle and let it cool and thus have is completely sterilized, and bring me a sample as fresh as possible. He did so, and examination showed a great number of bacteria, and that very soon after obtaining the urine. This indicated the presence of bacteria in the bladder, setting up a decomposition of the urine. In that instance it was a case of bladder instead of kidney trouble, as had been thought. That case had an enlarged prostate; the prostate had acted as a partial stricture to the passage of urine, and the patient had used a catheter, had not taken any precaution to keep it antiseptic, and had thus brought about much of his trouble. The operator washed out the bladder with some antiseptic solution and reduced the prostate, and the patient was out in a few days. He had been pronounced ready to die of kidney trouble, but the trouble was all in the bladder and prostate. In all our treatments we get particularly an effect upon the centers indicated in the spine, viz., the fifth lumbar and the second lumbar, the centers respectively for the hypogastric plexus and micturition. The treatment there is the same as I have shown you in how to treat the spine. There is another treatment, though, which I have also shown you, the treatment by raising the bladder bodily. You can do the same thing by having the patient stand in front of you, bending forward at right angle, thus letting the abdominal contents drop down toward the symphysis; then by deep pressure of your hands inward and raising as the patient straightens up, you can raise **all those** parts. I have spoken of enteroptosis, the dropping down of **the intestine**; I shall speak presently of the prolapsus of the uterus, and **all those** things that allow a lengthening and a relaxation of the ligaments which bind these abdominal contents to the walls.

Anything which allows a relaxation brings down those strictures, and the Osteopath argues that there is too little life there. Now, how does he replace those things? Should he simply push them into place, they would not stay—they must be held there. Hence, the importance of our work along the spine, stimulating the nerve force and life to the omenta, which should hold these abdominal contents in place, so as to regain their tonicity. Never forget that it will not do to replace a prolapsed uterus or replace intestines which are displaced by reason of enteroptosis, unless at the same time you include the work along the spine; that we work with the idea of stimulating the life of the ligaments and making them tense again. In fact, we should always have that in view, particularly we should be careful to stimulate or inhibit the nerve force to the **part in trouble**.

We would also work deeply over the internal iliacs. That is one of the treatments for the bladder also. We thus **stimulate** the blood supply and direct it **more particularly to the part affected, by reason**

of the tendency toward the normal. That treatment is very effective in such troubles. In retention of urine you will always suspect some stricture. You may have an enlargement of the prostate or some trouble with the sphincter of the bladder. You will find also that the quantity of urine varies—after long reading by a person who is not used to reading much, the amount of urine may be increased, and after hysteria and various troubles, the amount of urine is greatly increased. There is a motion for raising both the bladder and the uterus. Have the patient flex the thighs, then, directing him to hold the knees together, you push them apart. In other words, you work against the resistance of the flexed thighs. In that way the psoas muscles will contract, and the idea is that as you push the knees out the bladder will be raised; having done that, you try just the opposite, tell the patient to hold the knees apart and you draw them together. Mrs. Patterson employs that method of treatment very frequently and has had very good success in female troubles in that way. It affects both the bladder and uterus.

We should next direct our attention to the OVARIES. They are found an inch and a half inward from the anterior superior spines of the ilia. It is said that one cannot find them by feeling over the abdomen where they should be, and it is only when tender or when enlarged that you will be able to make out by physical examination the location of the ovaries. However, when inflamed, as they very frequently are, the intense tenderness there about an inch and a half interior to the anterior superior spine would indicate their site. Also when inflamed they frequently cause a swelling, and you will be able to find their location. The ovary is frequently the seat of tumor, which may become very large, and then not only palpation, but inspection, will reveal the seat of the trouble. Our treatment for the ovaries is through the lumbar region. The centers given by Howell's Text Book for the internal genitals are along the lumbar region from the second to the fifth; that is, vaso-motor fibers of both kinds run to the internal genital organs. We should also examine carefully the sacro-iliac region and the lower dorsal. The center for the blood supply for the ovary is between the tenth and eleventh dorsal, and you should look all the way from the ninth to the twelfth dorsal particularly, to see whether there is a lesion affecting the ovaries. We work upon the eleventh dorsal, restoring it to normal when it has been misplaced, both in cases of profuse menstruation and in scant menstrual flow. That seems to be the particular center since it has control of the blood supply to the ovary. Also, the spermatic artery in the male, becoming the ovarian in the female, arises about opposite the second lumbar vertebra, that is, a little above the umbilicus, and by working in deeply, trying to get as far as possible under the transverse colon, and working on down in the direction of that artery,

as far as the ovary, you will be able to stimulate the blood-flow, while by working in the reverse direction you stimulate the venous flow. Also work over the uterine blood supply, because these vessels anastomose a good deal, and you thus stimulate the entire blood supply. The ovaries are closely concerned with menstruation, and it will be worth your while to bear in mind that they act alternately, one will ovulate one month and not again until the second month. So if you have trouble recurring every second month, you will be able to calculate that the trouble is in one ovary or the other, and your further examination will indicate to you which is the ovary affected.

In cases of obesity where the patient is extremely large, cases are on record where the accumulation of fat has acted to crowd the ovary, hence the menstrual flow did not occur and the ovaries were atrophied. It may act in a mechanical way and separate the Fallopian tube from the ovary so that the Fallopian tube cannot take up the ovum when discharged. If you have a case of menstrual trouble where the person is extremely obese, you will bear in mind that the obese condition itself may have some effect in causing the trouble. The ovary, as it is situated in the broad ligament, is drawn down in any prolapsus of the uterus and will be implicated in many troubles of that kind. As for treatment, it is especially along the lumbar region and also at the centers designated; the eleventh dorsal, not forgetting the fifth lumbar, which is the center for the hypogastric plexus, through which we get the pelvic plexuses which have to do with the life of the ovary.

Q. In the case of paralysis you spoke of, caused by the grippe, what was affected?

A. The whole spinal life was affected. I have seen cases where the grippe was the only cause apparently and the whole muscular life along the spine was diminished.

Q. Do you think that can be corrected by treatment?

A. Yes, sir; I think we can secure good results.

Q. Does that include the ligaments along the spine?

A. Yes, sir; that is the main trouble. The ligaments are contracted, shutting off the nerve force.

LECTURE XXVII.

At the last lecture I spoke of the examination and treatment of the pelvic viscera. I shall continue that subject to-day, concluding the examination and treatment of the pelvis and its contents, and taking up the Osteopathic treatment of the limbs; I shall then have gone over the whole body.

I. EXAMINATION AND TREATMENT OF THE PELVIC VISCERA.—(*Continued.*)—The next organ for us to consider is the UTERUS. I might say in passing that female diseases are among the most numerous cases that we treat, and are among those best handled by us. A very large per cent of your cases will be various female troubles, and you will have very good success with them. The examination of the ovaries I spoke of at the last meeting. Next to the ovaries the uterus is quite as frequently the seat of tumors. These may occur in any part of the organ, and when these have enlarged the organ by their growth, you can by the ordinary methods of examination find the trouble. In general, speaking of troubles of the uterus, prolapsus is very common, anteversion, retroversion; also antelexion or retroflexion, the bending of the uterus on itself. When the uterus falls, it may fall forward and impinge upon the bladder, and thus one of the symptoms will be frequent micturition. It may fall backward and impinge upon the rectum, and you will have a mechanical cause of constipation; dragging pain in the loins and pain down the limbs. Frequently it is associated with local headache, which is generally on top of the head; it may be on the back of the head or it may run over to the forehead or to one side, but its peculiarity seems to be that it becomes a local headache. There are other symptoms, since the uterus becoming displaced will impinge upon other viscera and the plexuses of those viscera. You will have sympathetic troubles, such as vomiting, sick stomach, and things of that kind. In case of any displacement of the uterus, the patient is likely to be very sick at the menstrual period. At such times the fact that the organ is down and is thus stopping the flow of the blood, will lead to this condition. I have seen very painful cases at the period relieved immediately by replacing the uterus. However, that is not usually a good plan to pursue at the menstrual period, since the organ then is very tender, and handling is liable to irritate it and set up an inflammation or some growth. You must always be extremely careful in local treatments of the uterus.

There have been some remarkable cases instanced of an enlarged uterus. The uterus normally enlarges within physiological limits; it enlarges also from tumor. The chief way in which tumor is differentiated from the normal enlargement of pregnancy, is that after a certain time you can hear the uterine souffle and the fetal heart beat. Also after the fourth month, sometimes before and sometimes later, you will get the movements of the fetus. Dr. Smith tells quite an amusing story of a lady who came to term, she was perfectly sure that she was ready to be delivered, but he found merely gas in the intestines, a peculiar movement of the gas had simulated the movement of a fetus, which had been taken for quickening, and the accumulation of gas in

every respect simulated pregnancy. I only speak upon these subjects in a general way, because in gynecology and obstetrics, which you will take up later, they will be treated fully. What I aim to tell you is how the Osteopath treats the uterus. In examining the uterus, besides these general symptoms I have given you, a local examination will usually remove all doubt. By inserting the finger into the vagina you can feel at the upper end of the vagina, the uterus. You know how the uterus lies in relation to the passage of the vagina—nearly at right angles, perhaps not quite. The normal feeling of the cervix is described by Doctor Still to be about as hard as the end of the nose. On account of the transverse direction of the os uteri you can tell whether or not the uterus be fallen or twisted. If you find the os, instead of being directed from side to side, is turned at an angle, you can judge from that in which direction the uterus has been turned. The most common displacement is said to be downward, backward, and to the left. Frequently you will find a turn associated with this displacement, and the uterus lies down near the left sacro-iliac articulation. If the uterus has fallen forward, you will find the cervix and os projecting backward, and if it has fallen backward, you will have the cervix and os projecting forward. So you will be able to judge as to its position. That is what the Osteopath ascertains in making examination per vaginam—he examines to see whether or not the uterus is in normal position.

You know about the eight ligaments of the uterus; the broad ligaments are the most useful. They extend from each side to be attached to the pelvis, and when the uterus is displaced to one side you will find a tenderness in the broad ligament on the opposite side, readily explained as the tension comes upon the ligament of the other side, the weight coming on it as the uterus falls from it. Another point in examination per vaginam is to note the condition of the vaginal walls. In prolapsus the walls have lost their tone; they have part of the duty of sustaining the weight of the uterus. When they are full of tone they will help to hold the uterus up, but if they are prolapsed and sunken down they become flaccid. Frequently you can give great relief in female troubles by simply passing the finger up before and behind and at each side, smoothing out these wrinkles which have gotten into the walls of the vagina. You can also by that treatment stimulate the flow of blood and the local nerve force, and thus lead to more life in the vagina and consequently to a better performance of its duty of helping to hold the uterus up.

You will find such troubles as leucorrhœa following the displacement of the uterus, since the nutrition is partly cut off from the walls of the vagina, the circulation is impeded and the healthy tone does not exist, **consequently you have a morbid secretion.**

The normal position of the uterus I suppose is known to you—the broad ligament tilts somewhat backward in the pelvis and the uterus is tilted forward at the upper end of the vaginal passage, so that you have practically speaking a right angle between the canal of the vagina and the uterus; perhaps not quite a right angle. The uterus normally does not rise above the brim of pelvis. I wish to emphasize what I said the other day in regard to prolapsus of the uterus and of the intestine, that is, the Osteopath replaces them, but does not expect them to stay simply because he has replaced them. You must always couple local treatment with treatment along the spine. I remember a case in point—I examined a young lady in Peoria, she had a twist in the gymnasium, she had jumped to catch a cross-bar and had given herself a jerk and a twist. Along in the upper lumbar region there was a lesion, I do not remember now exactly which vertebræ were displaced, it was, however, one of the lumbar vertebræ, there was quite a prominence of one of them. Shortly after the accident the young lady was bothered with frequent micturition, and local examination later revealed the fact that the uterus was down upon the bladder. That case was treated at the abdomen, over the iliacs, and along the spine, particularly at the second and fifth lumbar centers, through which you can reach the uterus. The case was entirely cured within two months, and she had not had local treatment more than a half dozen times. So you see the Osteopath does not depend upon simple reposition, he depends largely upon the work of stimulating the nerve force and toning up the blood supply to give tone to these ligaments which have lost their strength, and thus hold the parts in place. The first finger is usually inserted, and you can feel the cervix of the uterus. The idea then is to push upward in such a way that the organ will take the position of being at a right angle to the broad ligament, and it is well, while your patient is upon the table to insert the finger, reach upward to the uterus, then have the patient slip around and stand up and you can then push the organ up into place. One of the best ways of replacing the uterus is to have the patient take the knee-chest position—kneel with the chest down upon the table or bed, and then to push the uterus up, and thus allow the intestines to fall down behind and over the uterus and hold it in place. Doctor Still has invented an instrument which is very useful also in re-position. It is a wire, curved with a handle. The finger of the operator is slipped in with the instrument, lying in the opening between the two wires, and then the point of the instrument is placed either behind or in front of the cervix, depending upon the position of the organ, whether it has fallen forward or backward. Then with the point of the instrument back and the finger in front, or vice versa, you can place the organ as you wish. Also you can by working upon the abdomen aid to lift the

parts. I have already shown you how that is done. That is, you raise it with the patient upon the back as I have shown you, or with the patient upon the side, or standing bent at a right angle, and you, pushing the fingers in deeply over the abdomen, raise the contents bodily. It is also a good idea to have the patient practice taking the knee and chest position and simply dilating the passage, the atmospheric pressure will sometimes be sufficient to cause the uterus to take its place; also the motion I showed you at the last meeting, having the patient lie upon the back, flex the thigh, and the operator draws the limbs apart while the patient is holding them together, and draws them together while they are held apart by the patient.

Treat especially the centers mentioned, that is, the second lumbar, which is the blood supply for the uterus, and the fifth, which is the center through which we reach the hypogastric plexus, and all along the lumbar and sacral region in general, but do not fall into the error of thinking the trouble is always there, because the lesion may be above or below the center at which you naturally expect to find it.

I have already mentioned the point that you should stimulate the coccygeus muscle through the sacral plexus, and thus cause it to contract and aid in raising the contents of the pelvis. You can also stimulate the round ligaments which pass over the pubic arch just external to the symphysis; you can find them both by the touch and by their sensitiveness, because when you impinge upon them you will always have an expression of pain. Stimulation there will help to draw up the uterus; all these things help a good deal. Stimulation at the second lumbar is used to cause contraction of the longitudinal fibres of the uterus, while stimulation of the clitoris and round ligaments is used to cause contraction of the circular fibres of the uterus. Consequently, we inhibit over the clitoris and round ligaments to cause them to relax and thus relax the circular muscular fibres of the uterus. That is one of the most important points in Osteopathic obstetrics.

In young females and in pregnant women it is advised never to give an internal treatment. It has been found that remarkably young children are sometimes suffering from prolapsus, and mentions a case in which the patient was not over two years old, but the case was entirely cured by external treatment. Should you be treating a case for other troubles in which the patient is pregnant, carefully avoid the ninth and eleventh dorsal and the second and fifth lumbar, in fact, the whole lumbar region.

Dr. Bolles has mentioned a point to me which is extremely interesting, and I think important also. In a case in which there had been abortion and the mother had kept wasting from the uterus, a discharge of matter and flow of blood, he directed her to rub the nipples each morn-

ing with vaseline, and thus to simulate as far as possible the normal irritation made by the suckling child. She was thus acting in accordance with Nature, and the discharge ceased. In another case he followed the same rule; the pregnancy was about three months along, and the indications were that the foetus had been dead for some days. The nipples were stimulated, which caused contraction of the uterus, and the woman was delivered of a still-born child. There is a very close connection between the nerves of the breast and of the uterus.

It is a very good point in flooding, profuse menstruation, or in flooding after child-birth, or in post-partum hemorrhage, which is a very serious thing, to give a quick jerk at the mons veneris, thus causing pain and contraction; that will usually stop the flooding. I knew of a case not many months ago in which the flooding was persistent, and lasted for some time. I sent word to the patient to try the treatment I have described and the flooding ceased immediately. Also in case of post-partum hemorrhage Doctor Still says you should insert the fingers into the uterus and press upward against the fundus. He presses up to smooth out any obstruction which may cause the trouble; there is some obstruction there which is hindering the proper flow of the blood and so causing the hemorrhage, and simply that pressing up allows the blood vessels to resume their normal relations and the hemorrhage to be stopped. You understand that when you come to consider uterine troubles, it is a subject for the specialist, and you will hear this subject fully treated in gynecology and obstetrics. I cannot do more than simply mention to you the usual treatment; this will also be the case later in this lecture when I will take up the subject of dislocations, you will get them more fully in surgery, but I will give you the usual Osteopathic treatment for them.

In the EXAMINATION PER RECTUM, which is frequently resorted to by the Osteopath, in the female if you will at the same time insert a catheter into the urethra you can feel the urethra along the anterior wall of the vagina. Here is an important point which I have never heard mentioned except in connection with Osteopathic practice; if the vaginal walls are relaxed and have fallen in response to a prolapsed uterus, you may very likely get a twist or an obstruction of the urethra through the prolapsus of the vaginal walls. There have been some such cases here, and the trouble has been readily cured by smoothing out the vaginal walls in the manner I have described, and by passing a catheter up the urethra, straightening out the urethral passage.

You find in digital exploration of the rectum the grip of the external sphincter, and you will be able to judge whether or not it is normal. The normal grasp of the external sphincter is extremely powerful, and in all these internal treatments you should insert the finger only after it

has been well oiled with vaseline, soapsuds, or something of that kind. You will have no difficulty in inserting the finger into the rectum; the palm should be turned toward the coccyx, and the finger inserted and then turned; the patient may be on the left side, or may be stooping, bent over the table. You will also in your practice meet cases of prolapsed rectum, the gut may be prolapsed and be folded upon itself in just the way the vagina prolapses. In Chicago I had a case in which the patient came in great pain, there had been a rectal prolapsus, and there was great tenesmus—a feeling of wanting to go to stool continually. It was extremely painful and the patient was able to walk only with great difficulty. I surmised at once that there was a prolapsus, and I inserted the finger and crowded the walls of the rectum upward all the way around. I was able to relieve the case and he had no trouble for some time afterward. In such a case you must adopt the method of treating over the spine to stimulate the nerve force and blood supply to that part, and thus give permanent relief.

In the male you will find, after inserting the finger for about one inch and turning it forward, the prostate gland. It is said by some authorities that the prostate gland is almost universally enlarged in men over forty years of age. The enlargement of the prostate is frequently the cause of stricture of the urethra. You will find the lateral lobes of the gland enlarged, or the central lobe may be enlarged. Should the lateral lobes be enlarged, there may not be much difficulty, but if the central lobe is enlarged you are very apt to have stricture of the urethra.

All of these internal treatments should be resorted to only in case of necessity. You should not treat internally very frequently; not more than once a week, and sometimes not more than once in two weeks or a month. Be very careful in treating internally, as you may irritate the internal parts. When the prostate is enlarged it may set up considerable irritation, and curing that may be the only way of curing certain genital troubles in the male. The prostate is often easily reduced; you can reduce it in a half dozen treatments, treating once a week or once in two weeks.

Q. Is it reduced by local treatment?

A. By local treatments. Of course you must couple with that treatment over the internal iliacs to tone up the blood supply.

II. OSTEOPATHIC TREATMENT OF THE LIMBS:—In consideration of the ARM, the ball and socket joint at the shoulder is the one most likely to be dislocated. First, I will describe the ways in which this dislocation may occur. The dislocation of the humerus may be downward into the axilla, it may be backward upon the back of the scapula, or in front under the clavicle, or it may be slightly upward, against the coracoid process, called a partial dislocation. The treatment for any of these is practically the same. One good way adopted by the practice is to put

the knee under the axilla firmly; you would have an assistant holding the patient to exert counter pressure. Then press the arm strongly downward, and thus spread the joint, bringing tension upon the contracted muscles and upon the ligaments, and they will draw the bone down into place. Another way is when the patient is lying upon the table, to place the stocking foot in the axilla, and you can get a powerful leverage by drawing the arm downward from the shoulder, and can force the bone out into its socket. This is a frequent dislocation in practice. In the gymnasium the shoulder is very frequently dislocated and set by a move on the rings, without harm. This joint is usually set without difficulty; it must be set very soon after dislocation.

In dislocation of the ELBOW, there are five different displacements. Both bones may be dislocated backward, both bones may be dislocated internally or externally; the ulna may be dislocated backward, or the radius may be dislocated forward into the hollow on the front of the humerus, or it may rarely be dislocated backward. One method is to place the knee in the bend of the arm, and then by having your assistant exert counter traction above the elbow, you can spring the arm down strongly. That will do for the first three. When you have thus exerted considerable tension, enough to overcome the contraction of the muscles, the bones will slip into their places. When the radius is dislocated forward, that would draw the hand back, and by turning the hand toward the supine or half supine and exerting traction downward and outward in such a way as to pull the head of the radius down towards its position, you will be able to work it into place.

In dislocations of the WRIST, both bones may be out of place; the radius may be forward or the ulna backward, and in all those cases simple extension is required; you have your assistant fix the elbow while you exert powerful traction upon the parts until they have been drawn into place.

In dislocation of the FINGERS it is said dislocation is usually between the first and second phalanges, and there, also, simple extension is required, drawing straight upon the finger until the bone is slipped back into place.

As to the usual way of treating the ARM, you have seen that we frequently use it as a lever. In some cases as for instance in articular rheumatism, we work with the idea of spreading the joint and allowing the blood and nerve force to be freed about the joint, especially allowing inflow of blood, the stimulation of the blood flow thus removing the deposit in the joint. You can readily stretch the joint by doubling your hand and putting it under the axilla, taking care not to present the knuckles toward the axillary glands, and then pressing the arm in against the side. That will draw the shoulder down, and I have had some very good success in relieving cases of articular rheumatism in that way. In spreading

the joint you can also stimulate. Place your hand upon the front of the elbow and then bend the forearm strongly over your hand; that will spring the joint; and also by turning it out at a right angle (you know how the olecranon process articulates at the back of the humerus), by bending the arm at a right angle so that it will not catch, you can exert pressure to spread the joint. Also you can stimulate the flow of blood down the arm by a certain twisting motion. I have hold of the arm and move the head of the humerus in the socket. I twist it in that way without exerting much force.

I might speak here of the fact that you can impinge upon the nerves of the inner side of the arm, the branches of the brachial plexus running down there, and the axillary artery. In general, if you impinge upon an artery, press it toward the bone; do not press it toward the muscle. You will find in your practice that these nerves may become paralyzed by the use of a crutch, setting up crutch paralysis, and that is a point which is well taken into consideration. Also we have found in our practice that something will catch here at the anterior part of the shoulder; whether it is deltoid fibers under the coracoid process, or whether it is a simple binding of the ligaments drawing the head of the humerus out against the acromion or coracoid, it is hard to say, but we frequently find a catch there which we can reduce by drawing the arm upward and backward, and then, when horizontal, drawing it outward, and by having the fingers in front over the process one can free any obstruction in that way. I have seen cases of extremely lame arms which could not be raised higher than the head, and could not be put behind the back, relieved by that treatment. Sometimes you will have such an injury as will cause a contraction of one of the heads of the biceps muscle. By straightening the arm and drawing it backward, thus lengthening the distance between the attachments of that muscle, you bring tension upon it. Frequently you will find that muscle contracted, and all you will need to do it to stretch it, thus inhibiting its nerve force, relaxing its spasm, and you get rid of the trouble.

In the TREATMENT OF THE LEGS you have all seen the various motions we perform; perhaps you have not all appreciated what the purpose of each movement was. When I flex the thigh above the thorax, and the leg upon the thigh I am stretching the quadriceps extensor muscle. You stretch it, and with it you free the blood supply, the femoral artery, the anterior veins, and the anterior crural nerve. That is the purpose of this motion which you see so frequently employed. Sometimes we simply use this motion as a leverage, having our hands in the sacro-iliac joints; you know its purpose already. You have thus stretched the anterior muscles of the thigh; you can stretch the muscles of the an-

terior part of the leg simply by pushing the toe straight down; hyper-extension. That is a most frequent motion that the Osteopath uses. You can stretch the calf muscles just the opposite way, by pushing the toe in the direction of the knee; and you will have no difficulty in pushing it strongly enough. We can stretch the adductor muscles by holding the leg straight, and separating the legs. You can stretch the external rotators by an internal rotation; it is very well to regulate the force in this way; in making this movement turn just enough so that the patient turns on the side, it is not necessary to use a great deal of force; then turn the other way until you have turned him about the same distance. We may also stretch the muscles on the back of the thigh. You know that in raising the knee, for instance, against the chest, you can only do it by bending the leg; if you straighten the leg you can get it to a certain height and then you feel tension upon the hamstring muscles, consequently we frequently use that in our practice. Putting the heel of the patient over the shoulder of the operator and raising the limb higher than it can naturally go, you thus lengthen the distance between the points of attachment of the muscles on the back of the thigh and stretch them. Frequently you will find it important to stretch those muscles. I had a case the other day of this kind, where the legs were drawn with rheumatism, the patient had no use of the limbs, they were considerably drawn, the toes were turned in, the muscles were set, and it was with difficulty that I could handle them. I brought deep pressure in Scarpa's triangle on the anterior crural nerves, and that relaxed the anterior muscles. I had another case in which was paralysis of the lower limb, and frequently the limb would jerk when I would treat it, so I inhibited the anterior crural nerve and the limb would relax directly. We pay particular attention to Scarpa's triangle since there we can impinge upon the femoral artery and vein, and upon the anterior crural nerve. Also we treat in the popliteal space; we very frequently knead it or work its contents, simply bending the knee, putting the foot of the patient between one's knees and working in the popliteal space; one can thus free any contraction there, and can stimulate both the popliteal nerves and the blood vessels.

Frequently in cases of rheumatism you will have trouble with the feet. You can straighten them down forward as I have shown, or backward. In treating the feet you will see that there are two natural arches, one lengthwise of the foot, and one crosswise of the foot; consequently in your treatment of the feet you can break it in two ways—you can spring it down toward the toes, or you can work with both hands beneath the instep and spring it toward the sides. In doing that the principle is that you stretch the ligaments about the tarsal joints. You can stretch the ligaments at the articulation of the ankle by this forward

and backward movement and by working it from side to side. By breaking the two arches of the foot as I have shown, you can relax all of the ligaments across the arch of the instep. Of course the toes can also be treated in the same way. We frequently are called to treat for corns along with the rest of our treatment. When you are treating a toe, you know the vessels run down the outside; spring it from one side to the other; that will stretch the ligaments and the blood vessels and stimulate the nerves.

Q. Would that treatment cure a cramp in the foot?

A. It would depend on the cause, if the cause were in the foot it might. You could very well cure some cases.

Q. Would it cure cramps on the bottom of the foot?

A. It would depend upon where your obstruction was; it might be higher in the nerve path. You would have no trouble in curing it in the foot; I have found that in my own case, by simply stretching it. Every one naturally does that; some people are much troubled by cramping in the feet.

It frequently becomes the duty of the Osteopath to STRETCH THE SCIATIC NERVE by stretching in this way: placing the heel of the patient over operator's shoulder, keeping the knee straight, and then, since the branches of the nerve run on down over the plantar surface of the foot, pull down on the toe and you can stretch the sciatic nerve considerably. Also, in the treatment of sciatica it is one of the treatments to rotate the limb outward, thus to relax the muscles throughout the whole course of the sciatic nerve, or, by an inward turn, relax the pyriformis and those short muscles, the external rotators which may impinge upon the nerve.

As to DISLOCATIONS.—Frequently you meet a dislocation of the ankle. The foot may be thrown outward, in which case you have an inward dislocation; or it may be the reverse, or these bones may be thrown forward upon the ankle, in which case you have a forward dislocation. In a few cases you have a backward dislocation. The movement is to have your patient lying down, flex the thigh at a right angle, have your assistant fix the knee so that he can exert counter-extension, then you exert traction and bend the foot in the direction in which it would go. If it was thrown outward stretch it and bend it inward, and vice versa. We do this in the case of the toes, simple extension is the method employed.

In the case of the knee the dislocations also are four; inward or outward, forward or backward. It is said simple extension is enough. However, the Osteopath uses this movement: he flexes the thigh at a right angle, and then reaching in at the popliteal space he grasps both the internal and external hamstring tendons and pulls outward with the idea of spreading them, drawing them away from the prominences at

the end of the femur; and then he pulls with considerable tension and attempts to spring the joint back into place.

Dislocation of the knee is rather serious, as it is especially apt to be followed by inflammation.

As to the HIP. There are four dislocations described for the hip. One is upward and backward upon the dorsum of the ilium, in which case the leg is shortened and the toes are turned inward. Another is backward into or near the sciatic notch, in which case also the limb is shortened, though not so much, and the toes are turned inward. The third is forward into or near the obturator foramen, and is called the thyroid dislocation. It is the most difficult with which we have to deal, and when such is the case the knee is bent, the toes point to the ground and may rotate inward or outward. In the other case the head of the femur is forward upon the pubic arch, and the turn of toes is invariably outward. So you have two in which deflection of the toes is always inward, one in which it may be inward or outward, and one in which it is invariably outward. Dislocations when they are new are fairly easy to reduce, but the Osteopath gets them almost always when they are old.

Your treatment must first be directed to softening all the ligaments and the muscles, removing the unnatural tension, and thus get the hip ready to set. These old cases are almost always slow to set, though I have seen some long standing cases set in a few treatments. You always have two factors of great aid to you, one is the anterior "Y" ligament of the hip joint, and the other is the action of the small muscles, the pyriformis, obturator internus and externus, the two gemelli, and the quadratus femoris. They are attached in such a way as to draw on the great trochanter. When it is up, they are below, consequently they are of great importance to us in setting a hip. If the hip is up and back, you flex the thigh still more, turn it inward strongly until you get the tension of those muscles, and then rotate the knee outward, and get the head of the femur to travel over the edge of the acetabulum. That looks easy, but I will assure you it is not. When it is dislocated backward into the sciatic notch, the idea is to flex the thigh, work the knee inward to disengage the head of the femur from the notch, and then rotate it outward and forward, and you get the head of the femur drawn toward the acetabulum. When the dislocation is forward into the obturator foramen you are usually in difficulty. The motion described for that is to flex the knee and to rotate it inward, using the attachment of the "Y" ligament as a fulcrum against which the limb works. Flex the thigh and work the head of the femur outward, or toward the cotyloid notch. In the fourth dislocation, where the head of the femur is over the brim of the pelvis, considerable tension is exerted back-

ward, long enough to stretch these ligaments, and then try to lift the head of the femur over the arch. †

In diagnosing of the hip dislocations you frequently find it very difficult. If the dislocation is backward into the sciatic notch, the limb will be a little shorter, the toes will be turned in, and when the patient sits up you have a shorter limb. While if it is forward it always lengthens the limb for the patient to sit up upon the table. As I have said, the hips get out and stay out for a great length of time, and we have a great deal of trouble in getting them back. Of all the dislocations, the most difficult to treat is the one into the obturator.

LECTURE XXVIII.

There are two or three points to which I neglected to call your attention at the last time. I mentioned treating the *prostate gland*, but did not show you how to treat it. You know how to find the gland, and working down across it on each side with a fairly firm pressure, just to stimulate the flow of blood through it, is the motion employed.

Also, as to the *saphenous opening*, we treat that by stretching the thigh which has been flexed, outward; that will enable you to stretch the muscles about that opening, then by rotating the limb inward and relaxing the muscles, you can work your fingers in at the opening; you stretch the muscles about it and free the opening.

Tenesmus in the lower bowel occurs frequently in diarrhoea and in other troubles. This can be relieved by working over the *sacrum*, especially over the muscles, to stimulate and thus cause a contraction of the sphincter and a relief of the feeling of *tenesmus*.

Frequently after parturition the disease known as *milk leg*, or *phlegmasia dolens*, occurs, and is probably due to a contraction of some of the short muscles, probably the pyriformis; it sometimes happens that the hip has been thrown out in the efforts of parturition. Always after attending such a case the hip should be turned to see that it is properly in place, and see that the muscles are properly stretched. The saphenous veins should be treated also.

Q. How would you treat for fainting?

A. By the common methods employed—anything to lower the head; some people, for instance, when they know they are going to faint, as some do, will drop over the back of a chair, with the head down, and that will stop it. When such has occurred, get the head of the patient lower than the feet, you can have him hang his head over the end of the table at the foot; or you may shock him, pull the hair, or a slap will draw the blood to the head when it is exhausted.

Q. I have a case in mind in which bleeding of the nose occurred and lasted four or five hours before it was stopped, and the patient finally died. What would be the treatment?

A. To check epistaxis or bleeding from the nose we work in the superior cervical region, stimulating; that is frequently of use. Or you may hold the facial artery where it crosses the angle of the jaw, or hold the nasal branches just here at the inner canthus of the eye. Hold them strongly. That is the usual treatment, particularly the stimulation in the cervical region. i

Q. In case of a lady whose babe is about fifteen months old; since the birth of her child she has had an extremely sore mouth, the condition of the alimentary canal has been such that she could eat but a very light diet; diarrhea all the time, and a gradual wasting away of her strength and muscular system until she is almost a skeleton. What could be done Osteopathically?

A. It is the disease known among the medical profession as nurse's sore mouth. What we would describe as a general treatment should be given; a general spinal treatment to tone up the nervous system particularly, reaching especially the centers for the bowels, the splanchnics, and reaching also the kidneys and the liver, toning up the secretory and excretory organs, and keeping the system in as good a condition as possible. i

Q. In the case of a person taking a hard cold, or the disease known as la grippe, how would you treat?

A. I would give a strong stimulating treatment. That is a thing that is very important. I have already spoken of the effects of la grippe several times, and I have found the most serious results following it after a long period of time. Have the patient on the face for the first and loosen all the muscles. This treatment will also apply to what is called a bad cold. I have had some excellent results in treating bad colds, and you can usually cure them. Use this general treatment. With the condition brought about by la grippe there is usually a painful aching in the back, especially along the lumbar region. I then have the patient on the side, and having loosened the muscles as shown, I would spring the spine all along by working underneath; you know the various motions. You can separate the pelvis and the shoulder by putting your two arms between them and springing the spine. Then for this backache in the lumbar region, I would go particularly to the fifth lumbar, having first loosened all along the lumbar region, and spring the spine. The ache there is probably caused by the tension of the ligaments, and while we usually use an inhibiting motion to free one from an ache or pain, it depends upon what it is caused by. If it is caused by the contraction, as it probably is in such a case, the relaxation of the

ligaments should do the work. I would then treat for the kidneys, with the patient on the back; reach underneath and stimulate along the region of the lower splanchnics and upper lumbar. I would also in that case treat the liver and the bowels. Give the neck a thorough treatment; I have already explained all these things in detail in going over the parts of the body. The neck is a part of the spine, and you must be particular in watching there to see that this contracture of the deep muscles does not affect important nerves, as it may very readily do. Use the motions given; first relax all the muscles, then work deeper and spring the neck to relax the ligaments. You can work from side to side, and before completing the operation I would give the straight pull, and the bend of the neck, enough to raise the patient's head and shoulders from the table. That motion will stretch all the spine. Then I would free all about the head and face, the points of the fifth nerve, those places at which you know how to reach it. To free the nose press firmly upon the forehead, spring the jaw down, and work thoroughly at the styloid processes. It would not hurt to work the arms and lower limbs, in fact, go all over the system to loosen any structure, either muscle or ligament, which may be contracted by the effects of la grippe.

Q. What would you consider a few of the most essential points in consideration when a patient first comes to see you?

A. That is a very good question, because it involves the question of how to start about an examination. I would first take the pulse; it is my habit to do so, I do not know that it is necessary always; others, I believe, do not do it, but the pulse is always considered an indication in diseases. I would then go to the spine and examine it thoroughly, but of course I would be questioning them as I went concerning all the symptoms. In fact, before taking the pulse I would ask them all about the trouble; I would get the subjective symptoms.

Q. Do you think the history of the case is essential, then?

A. Yes, sir, it is.

Q. Please give the treatment for goitre.

A. For goitre we would give essentially neck treatment. Frequently goitre is caused by an obstruction of the thyroid veins. However, I think it is often caused by some impingement upon the nerves supplying the arteries and veins, consequently you have an obstruction there. The idea would be to thoroughly relax all the muscles and ligaments about the neck, give the neck the straight pull and the turn from side to side, and bend it backward, since there are anterior muscles in the neck which you must take into consideration. Sometimes it is those muscles which are contracted and are pressing down upon the nerves and vessels. If it is a hard

goitre with a fibrous capsule, it is very difficult to cure. If it is an exophthalmic goitre you will have difficulty in curing it, but the ordinary goitre is dealt with with considerable success, although it frequently takes a long time. In treating for goitre I would also, besides the general treatment, work locally over the thyroid gland, which you know is the gland enlarged in goitre, work across it from side to side, to free the veins. Raise the clavicles.

Q. How would you treat enlarged parotid, submaxillary or sublingual glands, exceedingly large ones?

A. Do you know what caused it?

Q. Not unless it was scrofula.

A. I should give the treatment for the general system first; we must get rid of what is causing it, whether it be impurities in the blood, or a scrofulous condition, or anything of that kind. Any case would depend upon general causes to some extent, and you would have to give a general treatment to purify the blood. That is, attend to all the avenues of secretion and excretion and of assimilation and nutrition in general. The local treatment would then be confined to loosening all the parts, and freeing the blood and nerve supply to the organs affected.

Q. Please give the treatment for reduction of fevers.

A. In the first place it is said that when there is fever in the body that it is made by the refuse not being cast off, and hence being burned. Nature is making an extra effort to burn the refuse, and hence is causing fever. Whether that be true or not, you know that there is, in many cases, almost a complete suppression of urine in fever, or if not so much as that, that the urine is scanty and high colored. You must go to the kidneys and free their action. Go also to the bowels and free their action; combine the general treatment. Look for the cause; of course it would depend upon what kind of fever it was; and then having treated the particular cause, the Osteopath also goes to the superior cervical ganglion, and causes a general vaso-dilator effect. You can inhibit the superior cervical ganglion either opposite the transverse processes or in the sub-occipital fossæ. Then give the treatment in the upper dorsal region, stimulating the action of the lungs to help them to carry off the poisonous matter in the body. Also treat the splanchnics. In general, go to the cause. I suppose you have heard Dr. Still's theory of fever—he says that the lung is not acting properly, that the gases are not properly condensed, and he treats fevers through the lung a good deal, to get it to act properly that the poisons of the body may be excreted properly.

Q. Would you treat the vagi in fever?

A. Yes, sir, we would treat them for the general effect on the liver and intestines, and you could stimulate them to inhibit the pulse. Of course you have not cured the fever simply by slowing the heart, that is an

adjuvant. You must go to the first cause; having done that work I should also go to the splanchnics, as I have said, and should inhibit there; having inhibited the cervical, I would inhibit in the middle dorsal region or along the splanchnics, and then I would go to the fifth lumbar, where you get the center for the hypogastric plexus and through it the pelvic plexuses. Your object in doing that is to dilate the vessels; inhibit the vaso-constrictors and stimulate the vaso-dilators, or you tend to restore things to the normal. In other words, you free the parts affected, and dilate the abdominal veins. In that way you equalize the circulation. That is just part of your general work, and it depends on the kind of fever; in typhoid fever you have to go to the intestines and treat them.

Q. How do you treat chills?

A. Stimulate the heart to propel the blood faster; stimulate the lungs so that the blood will be better purified and warmed.

Q. Where the fever follows the chill as soon as it is over, would you begin treatment for the fever at once?

A. If I supposed it would come on right away, I would be on the watch for it; I do not know that I would begin to treat immediately. But having taken those general points together, I would also combine with that general spinal treatment and treatment for the heart, a general stimulating treatment, and in some cases it might not hurt to stretch the limbs, and do all you can to stimulate the flow of blood through the body. In chills and fever treat especially the liver and spleen.

Q. Just about what you would do for a cold or la grippe?

A. Largely that general treatment. Then rapid rubbing upward along the spine, hard and quickly, will cause a chill to cease. On one of the hot days last summer I was called to a case; it was not a regular chill, but the person had become over-heated, and the blood had left the surface of the body. He felt extremely faint, had difficulty in standing up, and was covered with a cold, clammy perspiration; the surface of the body was chilly. I immediately stimulated the heart and lungs, inhibited at the superior cervical, and gave a general treatment to equalize the blood and keep it circulating. I had the patient keep quiet and he soon felt all right.

Q. I would like to know what treatment you would give for vaso-dilator effect and for vaso-constrictor effect, to inhibit the flow of blood or increase it?

A. I do not know that I would give any in that way. For instance, go to the splanchnics, they contain both vaso-dilators and vaso-constrictors; go to the sciatics, they also contain both. Now, I cannot treat the sciatic or the splanchnics and cause that particular set of fibers to act alone, that is, I do not know that I can, and frequently I employ a method which I say will inhibit and frequently do that which we say will stimulate, and no doubt we do so. It is very hard to say just what we do there, I

tend more and more to the belief that we simply restore something that is abnormal to the normal condition, and allow nature to do the rest. I think that is the best theory by which we can explain so many things, while there are many things we cannot explain by the theory of stimulation and inhibition.

Q. If a person faints from overheating, is there not any special treatment besides holding the head down. Dr. Charley Still seems to have had good results in that trouble?

A. In such a case you would also have to direct your attention to the general condition. In case of overheating, where there is an inward congestion, very likely the blood is prevented from flowing to the head and is congested about the lungs particularly, and about the intestines, since there the veins dilate the most readily and hold the most blood. You would have to apply your stimulating treatment, and cause the blood to circulate freely.

Q. Give us a treatment for diphtheria.

A. Diphtheria, of course, is a constitutional trouble. You will have to prevent the membrane forming if possible, and that can be done. Dr. Charley Still has had the very best experience; more than any other Osteopath. He had a remarkable run of cases in Red Wing, Minnesota, and had remarkable success. His treatment was very largely about the neck and throat; he would treat there to keep the blood supply open; you know how to do it, free all the muscles and ligaments, and especially keep the anterior muscles softened and loose so that there can be no tension there or stoppage of the blood, allowing an excretion to grow in the throat and form a membrane. You must attend to the bowels and the kidneys and the general health.

Q. When the membrane does form, what do you do?

A. Cause the patient to vomit is one way, in order to throw it out, and there are certain drinks that they use to loosen the membrane.

A. Dr. Charley Still said that he frequently would come back to a case inside of fifteen or twenty minutes. He was unprotected by the law and he had to go very carefully, or he would have had trouble.

Q. Did he treat for the fever?

A. Yes, you would have to treat for that according to the treatment outlined.

Q. In any acute trouble of that kind would you just treat for the symptoms you see, unless you find some lesion?

A. No, sir, that is hardly our method, you should try to find a lesion, in the spine particularly, and you would probably be successful.

Q. Suppose you did not find a lesion?

A. If you didn't find a lesion you could only go according to principles and work on the centers indicated, but you will find lesions, contracted muscles, or something of that kind.

Q. Give the treatment for granulated eyelids.

A. In granulated eyelids, first you must turn back the lids and examine them. Usually there is considerable irritation, and the eyeball is inflamed, then you will see the granulations existing as little white points all along on the inside of the lid. You may find them on both lids. Our treatment there locally is, after having wet the finger with a little soap suds or vaseline, to gently work all along under the edge of both lids and to rub on the outside of the lids as you go along; that will crush the granulations. Some say that the granulations are caused by the stoppage of the ducts of the Meibomian glands. Dr. Still, however, says that there is some obstruction to the veins, that the blood is brought to the eye and cannot get away, consequently it must do something, and it goes to work to build up some growth. That seems to be the most reasonable theory. If you want to know particularly about granulated eyelids, ask Dr. Hildreth; he had quite a remarkable case, which Dr. Still cured. Having treated the granulations, treat the points of the fifth nerve over the eye here, on the forehead, at the inner and outer canthus of the eye, and at the supra and infraorbital foramina, to free the blood flow. Treat particularly through the upper cervical region, and look for any lesion in the cervical region; give the general treatment for the neck in order to keep the blood supply freely open to the eye.

Q. Where the upper lid is drooping, would you give the same treatment?

A. I would there stimulate the flow of blood and would stimulate the fifth nerve, since it is a muscular trouble, and you must tone up the muscles and strive to get them built up through the blood flow.

Q. Do you give the same treatment for cataract?

A. You would treat particularly through the fifth nerve for cataract, as the fifth nerve has to do with nutrition of the eye, especially its anterior part. You reach it through the superior cervical, at the inferior maxillary articulation, and through these points that I have mentioned over the face. Also look for any lesion in the cervical region or in the upper dorsal. Give the general treatment of the neck.

Q. In case of the eyeball turning inward, for instance the right one, through weakness of either the external muscles or increased strength of the other muscles, what do you do?

A. Some cases of crossed eyes have been successfully treated Osteopathically. I have known of cases being treated surgically, which is always to cut a few fibers of the muscle which is opposite to the one affecting the eye most—on the side pulling the most strongly; that weakens that muscle and allows its antagonist to be more evenly balanced in its

action. That will allow the eye to become straight. But the trouble with that operation is that after the person has gotten well and the general health has increased, this weak muscle, if the trouble was of this muscle, will strengthen and pull too hard against the one which has been weakened by the operation. I have heard of such cases. The treatment there Osteopathically would be to strengthen the muscles. I have heard of a number of cases being treated. They are often successful.

Q. This is a case of a party about middle age and it came on suddenly.

A. I would by all means try it in all such cases; where it comes on suddenly that way it may be a nervous trouble, it may be a slip in the neck somewhere. I would not send the patient away and say I could not cure him, not unless I was positive. It is pretty hard to be certain. In some cases the Osteopath can not tell until he has tried, and if he is conscientious he must treat his patients awhile before he is sure.

Q. How would you treat for pneumonia?

A. In pneumonia the trouble is usually handled very nicely. The patient will have fever besides. The simple Osteopathic treatment is to stimulate the lungs, as I have shown, in the upper dorsal region all along on both sides. Find out particularly which one is affected by the methods which I have shown you. Treat for the fever. In children and old people it often follows measles or is a complication of them, and if you are called to a case of measles do not forget that complication; in all cases look out for pneumonia.

Q. Is there any way in which severe coughing can be stopped immediately?

A. It will depend upon the cause of the trouble. If I were called to such a case about the first thing I would do would be to examine the pneumogastrics to see whether or not there was some irritation in the neck affecting them. Or if I could not find it I would inhibit the action of the pneumogastrics. There are laryngeal branches supplying the larynx which may be irritated, causing severe coughing. It may be some irritation of the pneumogastric in the stomach that is irritating the nerves and causing the coughing.

Q. What would you do when it is caused from the lungs?

A. I would give a general treatment to the lungs.

Q. In case the heart ceases to beat for a short time, say during sleep, and the person awakens and cannot breathe until he has got on his feet, what would you do?

A. I would raise the ribs on the left side. I would draw the arm back strongly while holding my other hand in a V shape under the angles of the ribs. What you describe is probably palpitation, and may be nervous in origin. The idea there is that you give the heart more

room mechanically, by raising the ribs, and that you stimulate the sympathetics along the spine, which we reach along the upper dorsal.

Q. Give the treatment for rheumatism.

A. There are several kinds of rheumatism. In any case we go to the kidneys. We treat them always in the manner shown, to free the system of the acid which is present in case of rheumatism. Sometimes chronic rheumatism comes on without any other previous form, that is, it begins as articular rheumatism, and will strike one joint, say the shoulder, and next it will be in the knee of the opposite side, the following day it will be in the forearm, then in the wrist, and it jumps about from place to place. In such a case we would stretch the joint; separate it. I would also, for the shoulder, work along the dorsal region, loosening the muscles there; then I would stimulate at the origin of the brachial plexus, along the scaleni muscles, between which the branches of the plexus run out to the arm; raise the clavicle, stimulate the subclavian artery, and in general, thoroughly relax everything about that arm and free the forces of life to it. I would do that for any joint affected. In case of muscular rheumatism you must treat very gently, treat the blood and nerve supply to the part, and work over the muscles affected. That is, bring gentle pressure and stretch them. I have known of a case of general muscular rheumatism where we simply went over the patient, gave him a gentle treatment, stretched the muscles and the ligaments, and stimulated the kidneys and the liver and the general excretory organs.

Q. What is the treatment for flux?

A. The same as for diarrhea. I believe I showed that at one time. The chief thing which we do is to work strongly along the lumbar region, spring the spine strongly, and hold against it. I have seen cases treated in that way, the knees against your abdomen, and hold against the eleventh and twelfth ribs, inhibiting the action of the nerves to stop the rapid peristalsis. That is the theory. You can do that by setting the patient up in a chair, place your knee against the heads of the eleventh and twelfth ribs and pull the arms up and back. You thus get a strong pressure against this point. I would also stimulate the flow of bile. I described to you not long ago a case of flux of long standing; in that case I found that the two lower ribs were too close together on each side, and that there was a contraction and smoothness along the lower lumbar region. I relaxed that and straightened the ribs, and it took but two treatments to cure the case.

Q. Please give the treatment for catarrh.

A. That is general treatment of the neck, and is what I have already given, but I might mention a few points. They say always that there is a tender place under the angle of the jaw. The theory is that some

contraction, either recent or of long standing, is shutting off the blood supply to the membranes of the throat and nose.

Q. Do you treat in the mouth?

A. We sometimes treat through the mouth. You can put the finger back and work from the top of the palate down along the pillars of the fauces on each side; we sometimes do that.

Q. How would you treat a sprained ankle or knee?

A. Say it were the knee, you must be very careful, if it is a recent case and there is a swelling about it you must take the swelling down. I would not move the member much at first, and the best way that I know to reduce a congested condition from inflammation after severe strain is by the use of hot water, hot bandages, or the hot water bottle. After having reduced the swelling you can see if the parts are dislocated; examine to see if they are out of place or if there is any fracture. Of course if you are called at once to the case you can find that out at once. You should always do that as early as possible; find out if there are any dislocated parts, and if there are you must put them back as soon as possible. If there are no broken or dislocated parts, after having taken down the swelling, principally by the use of hot applications, I would work gently at the popliteal space to relax the muscles and stimulate the popliteal vessels, then I would bend the thigh and stretch the muscles about the saphenous opening to allow the blood flow above to be properly opened, and give the stretching motion to the leg to relax its muscles. I should then treat along the lower part of the spine, especially where we reach the sacral plexus, so as to stimulate the nerves of the leg.

Q. Those movements would be rather painful, would they not?

A. You would have to be very careful, perhaps you cannot do them at first. I have had cases of sprain where I would not manipulate at all for several days; I just used the hot applications about it, and watched to see that no trouble took place, but it was several days before I began to manipulate. At first you can treat the lower part of the spine without moving the leg, and I would do that. In these cases I have had good success. Sometimes the strain will not be painful, and you can manipulate the leg from the start; it depends altogether on conditions.

Q. Has Osteopathy come in contact with yellow fever or cholera, and if so, with what success?

A. Doctor Still says he has treated cholera. I do not know that we have ever had any cases of yellow fever. About all I know about the treatment for cholera is that Dr. Still says he treated the lungs, he was speaking on that the other day in relation to his theory of formation of gases in the lungs. He also stimulated the excretions.

Q. What is the treatment in Bright's disease?

A. In Bright's disease treat for the kidney. Bright's disease is a general name. However, it refers to a disease of the parenchyma of the kidney, and there are various forms. You would have to look for any lesion affecting the kidney along the lower dorsal region or at the second lumbar, and your idea there would be to work upon the nerve supply of the kidney by treating over the spine. Then you could work at the umbilicus, as I have shown you, to get these centers, or you can reach them by deep pressure over the renal ganglia, which lie on the renal arteries.

Q. How do you regulate the action of the kidneys when they are acting too frequently?

A. When the kidneys are acting excessively or too frequently, the idea is that you must find any lesion which may cause an irritation or inhibition of the nerve force. It is frequently confined to about what I have said, to look for the lesion and remove it, and then treat along the region of the spine where we get the nerves to the kidneys.

Q. Stimulate to increase the action, and inhibit to lessen it?

A. Well, that brings us back to the question of just what we do when we stimulate or inhibit. It would depend upon the condition there whether I would spring the spine and work in such a way as to stimulate or whether I would hold.

Q. If there was too much secretion, you would not treat in the same way as if you wanted to increase it?

A. I would be very likely to. I would work along the region of the spine which shows there is some obstruction to the nerve force, and my idea would be to remove that obstruction.

Q. Would you pull on the neck where it is turned to one side or the other, and turn it?

A. I would not pull it and turn it.

Q. I mean after it is turned?

A. O, yes; I would not be afraid to do that. I would have the neck turned, and this straight pull is about the best way, but I would not pull it and turn it, because you are likely to cause trouble. The parts are more apt to be stretched, and you may get an articular process out of place.

Q. In varicose veins, what would you do other than manipulate the nerves and the limbs?

A. I would work along the lower region of the spine and stimulate the sacral nerves, and I would stretch the leg thoroughly to stimulate the sciatic, since the sciatic contains the vaso-motor nerves for the limbs; then at the saphenous opening, I would loosen the tissues, as I have already told you how to do, and I would work upward from the varicose veins along the course of the veins to stimulate the flow of blood. Do everything to build up the tone of the limb. The trouble may be some-

where else, but it is most frequently in the legs, from standing on the feet too much.

Q. How would you treat neuralgia of the heart?

A. I would confine myself there to the upper dorsal region. I would go to that region first and would give the heart all the room to play in that it needed, then I would inhibit at the superior cervical region with the idea of inhibiting the nerve force and quieting the spasm if possible. You can do anything to reach the nerve force and quiet it. It is evidently excited and there is evidently some irritation. Your idea is to find the cause of the irritation and remove it if possible. It may be caused by some poison in the system, then you would have to remove the original cause by general treatment. The trouble is frequently in the costal cartilages, or in luxated ribs.

Q. How would you treat cerebral troubles?

A. Through the neck, it depends upon the case, of course.

Q. In hay fever would the treatment be anything different from that for general fevers?

A. Yes, look for the lesion in the cervical region or in the upper dorsal, sometimes the first rib is at fault, sometimes the clavicle, and you must look for the lesion in those places. We do not have the ordinary symptoms of fever in hay fever, it is a catarrh.

Q. How would you treat for lumbago?

A. I would relax everything along the spine, especially in the lower part; first by working the muscles, then by flexing the knees against me, then I would put the patient into a chair and lift up and turn as I lifted. I think the theory is that the tension of the ligaments there is affecting the nerves and causing the stiffness of the muscles. I have seen several cases treated in that way and very successfully.

Q. How would you treat apoplexy?

A. It depends upon general causes and conditions. It generally occurs in elderly people, where they are not used to much exercise, and perhaps after they have run for a train or to a fire. The heart is excited, and the vessels being weak and the general tone of the system being poor, there is a break of a small capillary in the brain and the formation of a clot. Perhaps it does not extend farther than congestion of the brain. Sometimes it is in cases of people who have long been bothered with congestion, and the blood does not circulate properly through the brain or body, and too much is thrown to the head. You would have to relieve the general causes, and you must in some way call the overplus of blood from the head. In that case you would treat over the superior cervical region particularly, and then to get your effect you would have to work over the solar plexus and the splanchnics to draw the blood from the head. That in general is the treatment. Of course you understand

these are just "snap shots." I cannot say much on any of these subjects here. What I have said is simply as far as time allows.

Q. What would you do in case of meningitis?

A. Meningitis is a germ disease affecting the spinal cord itself. I have treated chronic cases. In the case of an infant of two and one-half or three years of age the symptoms were a drawing back of the feet until the body assumed the form of a bow, a dribbling of saliva from the mouth, a lack of growth, the lower part of the body being undeveloped.

In an acute case the first thing to do would be to give a hot bath, evacuate the bowels; everything should be done to get the poison out of the system; when that was done I would give the patient spinal treatment, together with treatments upon the kidneys, liver, bowels and lungs. I am treating a case at present somewhat similar to this.

Q. What would be your method of treating the spleen when there was trouble there?

A. I would raise the ribs from the eighth to the twelfth on the left side, correcting any obstruction that might exist, giving the abdominal treatment to help remove the trouble. In malaria, where the spleen is congested, free the blood supply by working from the eighth to the twelfth dorsal vertebra.

Q. How would you cause vomiting by Osteopathic treatment?

A. This is sometimes very hard to cause. Some people never vomit no matter how sick they get, and others vomit at the slightest provocation. I have known of vomiting following manipulation of the solar plexus, and also upon deep pressure in the third left intercostal space.

Q. Give treatment for reducing fever. Is there any way to keep the fever from returning?

A. You might keep it down temporarily. I have seen cases of typhoid fever where the fever was kept down, but evidently the cause was not removed. Always see to removing the cause.

Q. Is there any effective treatment for barber's itch?

A. I do not know. I would open the pustules with a sterilized needle, and sterilize the pustules with carbolic acid.

Q. What is the treatment for colic?

A. Ordinary wind colic, the kind that babies have in the night, is caused by a disordered digestion. The treatment is to work the gas off the stomach, then stimulate the solar plexus and work along the splanchnics.

Q. Is neuralgia successfully treated?

A. Yes, the treatment for neuralgia is by inhibition. Sometimes it is caused by poisonous blood; sometimes by a pressure upon the nerves.

Q. In case of a paralysis of the lower limbs, where there has apparently been no circulation for three years, and after the patient had greatly improved, would the appearance of rash or boils have any bearing upon the case? Is this old waste matter, which has been dead for so long, carried off in this way?

A. I take it that the appearance of rash would be a good symptom, showing that the blood supply had been renewed.

Q. How would you treat convulsions in a young child?

A. Convulsions are sometimes caused by intestinal worms; by congestion at the base of the brain; sometimes by a congestion of blood vessels, or some displacement.

Q. Where and how do you treat for eczema?

A. I have seen cases of other troubles complicated with eczema and the result of treatment has been good. Usually the patient does not stay by the treatment long enough to get the desired results, as it is a slow process. The point is to build up the blood and purify it by treating all the avenues of excretion, and in that way remove the poison from the blood.

Q. Shell fish being eaten, hives appear on the skin (as a result of the food), and too long a time having elapsed to expel the food by vomiting, how could you treat this case to overcome the conditions where you could not expel the food at once?

A. If it was so that I could not cause vomiting, I would stimulate the bowels by the method already indicated.

Q. Please explain how glasses seem to give temporary relief when taken off for possibly five minutes?

A. I would conclude that the patient was growing away from the glasses. I would consult an oculist.

Q. Would you suggest any other treatment for measles other than keeping the bowels open?

A. Stimulate the lungs, because the poison seems to take root in them.

Q. How do you slow the heart's action?

A. By inhibition in the superior cervical region, and by raising the upper left ribs, and holding behind the shoulder.

Q. Please explain in detail the treatment for sea sickness.

A. Inhibition of the pneumogastric by thrusting the thumb into the third intercostal space on the left side. This treatment is also applied in the third and fourth intercostal spaces upon the right side, and in the fourth intercostal space upon the left side; to this I would add inhibition of the solar plexus by putting a pressure upon it, and stimulation of the pneumogastric nerves.

Q. What is the treatment for locomotor ataxia?

A. A thorough spinal treatment. This is a disease of the spinal cord. Stimulate the flow of blood to the cord from one end of the spine to the other. Give attention to the local symptoms according to their nature, e. g., for diarrhœa, constipation, loss of control of bladder or bowels, give the usual indicated treatment, with stretching of the lower limbs.

Q. How do you treat insomnia?

A. Stimulate along the spine to increase the circulation; treatment in the neck; thoroughly relax the muscles of the neck, reducing any dislocation or slip between the vertebrae, and finally, inhibition of the superior cervical ganglia.

Q. How would you treat a child troubled with worms?

A. Through stimulation of the liver, causing an increased secretion of bile sufficient to expel such parasites. The stomach and intestines should be stimulated as well, and the child should avoid eating sweets.

Q. What do you inhibit in the neck for cutaneous circulation?

A. The inhibition of the superior cervical ganglion gets its effect upon the circulation in two ways: 1st—through connection with the sympathetic directly, and second through its connection with the medulla by way of the sympathetic; the treatment, therefore, in this region influences the general circulation to the body in that it affects the vaso-motor center in the medulla.

Q. In what respect would a general treatment be compared in its general effects to a specialized or local treatment of a lesion?

A. A very general question. A general treatment would be to affect the general circulation and the general condition of the nerves; a local treatment, correctly speaking, ought to affect the circulation of the affected part under treatment. This only in the most general terms.

Q. Would not the tendency be to secure better results for a specialized treatment of the lesion in that a supply of blood would be drawn to that particular point alone and thus be better than the diffused state in the general treatment?

A. In general, I would say the more specific your treatment is, the more directed to the locus of the lesion, the better. The tendency of giving a general treatment is far too great already. General treatments should be judiciously employed as an adjunct to special treatment rather than as a hit and miss plan to affect the lesions.

Q. How do you treat for cold feet?

A. Stretch the limbs by flexing the knee against the thorax, and by rotation inward and outward, thus relaxing the muscles and correcting the blood supply. Also through stimulation of the lumbar and sacral regions.

Q. How can the bowels be moved quickly.

A. I should try a strong stimulation of the liver. In obstinate cases of constipation we frequently use the anema first.

Q. Where you have high fever caused by absorption of poisons in the blood, what should be the treatment?

A. Stimulate the kidneys and bowels and lungs, also cutaneous circulation; induce copious sweats, thus throwing off the poisons from the system; and work as already indicated to reduce the fever.

Q. What is the best plan to set lateral dislocation at the first and second dorsal.

A. I work as follows: I set the patient upon a stool with his back toward me, and use the head and neck as a sort of lever, so to speak, placing the thumb of one hand upon the side of the spine of the vertebra on the side toward which it has deviated; the other hand being upon the back of the head. I now bend the head down away from the vertebra in question, thus exaggerating the defect, pushing strongly down to the side, meantime pressing with the thumb upon the spine of the dislocated vertebra in a direction toward that from which it has come. The head is next pushed around to the affected side, thus relaxing the ligaments, while the vertebra is firmly forced back into place.

Q. Can parasites be removed by Osteopathic treatment?

A. The treatment has already been indicated, in part; I would add treatment of the liver, strongly stimulating the flow of bile; this Dr. Still says is sufficient to remove intestinal parasites.

Q. How would you treat a case of tooth ache?

A. Send patient to the dentist. We have in a few cases had good results by inhibition of the fifth nerve, reaching it in ways already indicated in the course of these lectures.

Q. Is it dangerous to reduce bacterial fever?

A. The theory that it requires heat to destroy them would indicate as much. In general I would say it is our practice to reduce such fevers. While perhaps the high temperature of the body might tend to render the bacteria less productive of evil results, yet further treatment which we employ in such cases would seem to make it safe to reduce the fever as we always do. We never omit in such a case to strongly stimulate the action of the bowels, kidneys and lungs, to throw off both the bacteria and their products. This treatment, coupled with the general spinal treatment, tends to promote healthy metabolism, thus building up the tissues of the body, blood included, and to render it less liable to the growth of bacteria. In other words the theory of bacterial origin is that there is a so-called *nidus*, or "nest," in the tissue in which the bacteria may grow. It is held by eminent authorities that bacteria will not grow in healthy tissue, hence if the nidus exists in unhealthy tissue, the work of the Osteopath in building up the tissues does away with the nidus, the ever present tendency being toward the normal, aiding in such a way as to cause the tissue at this par-

ticular locality to become healthy. Thus the nidus is destroyed, and the poor bacterium is left without a home. In regard to the germ theory, and in its relation to Osteopathy, I might say that while the Osteopath accepts such theory in general, he, remembering the fact that unhealthy tissue only can form a nidus, esteems it conclusive that there must have been a cause for the previous presence of the bacteria there, or there would not have been a nidus. He simply sees that the bacteria may become secondary causes of disease. Here his treatment is devoted to removing the primary cause, preventing the bacteria from gaining a foot-hold in the body.

PART TWO.

Principles of Osteopathy.

PART II.

LECTURE I.

SPINAL CURVATURES.

The Osteopath meets with many cases of spinal curvature in his daily practice, no matter where he may be located. It is a common and much dreaded disease. The Osteopath gets many cases to treat because he is the "bone-doctor," and people are quicker to come to him with such complaints, or, it may be, the failures of the usual modes of treatment adopted by the medical profession leave many cases for the Osteopath. He is successful in a fair number of cases, but finds many of too long standing to be cured by him, though he almost invariably benefits them. In curable cases, his success is flattering, presenting the most complete cures.

Of these, lateral, and simple posterior curvatures are most easily cured.

The importance of the spine has been noted. It might be called the foundation of the skeleton, since it supports all the important parts of the body, perhaps on the whole, more than do the limbs. It gets but little rest; e. g. any one with a troublesome "backache" finds the spine very much in evidence; at times neither sitting, standing nor lying, in any position will relieve the pain of the ache. Osteopaths should be careful of their own.

To fulfill its functions, the spinal column must be at once strong and flexible, and the wonderful device by which this object is accomplished is worked out by means of an intricate arrangement of bones, ligaments and cartilages, muscles, blood-vessels and nerves, each of which seems liable to its particular disability. The cancellous bodies of the vertebræ are liable to caries and necrosis; the intervertebral discs to ulceration, suppuration and changes of form from pressure; the ligaments to strains and rheumatic affections; the muscles to paralysis and spasms; and the blood-vessels and nerves, in this situation, to compression and abridgment of function.

Hence it is that to the Osteopath the spine becomes the foundation in a different and very important sense; and he regards the condition of the spine, rightly, as experience proves, to be the foundation of health or disease.

The fact of the compressibility of the intervertebral discs is one of great importance:

1. The whole spine becomes "settled" down together, rigid, smooth, interfering with general nerve connections; causing nervous and special organic diseases, and functional troubles.

2. Any single or several discs may be altered in shape by pressure, e. g., altering spinal equilibrium and interfering with important nerves or centers.

3. Discs may be ulcerated and eaten away, leading to ankylosis and permanent injury of the joint.

4. The most important part of spinal treatment is to separate vertebræ and allow discs free blood supply and room for growth. Treatment by suspension accomplishes this, as does also traction of the spine, described to you as a "straight pull."

Question of slight vs. extensive change in form of spine, with vast difference in effects: 1. Latter is gradual and parts become accommodated to changed shape of spine. 2. Former more severe and accompanied by acute pathological state of tissues. Question hard to answer. e. g. Hunchback and good general health vs. slight slip.

Several kinds of spinal curvature are described: 1. Pott's disease (Posterior angular curvature). 2. Scoliosis (Lateral curvature). 3. Kyphosis (Post. round shoulders). 4. Lordosis, Anterior curvature (Ant. in lumbar). 5. Spastic (Spasms of muscles). 6. Hysterical.

POTT'S DISEASE (Percival Pott), an inflammation of the spine, characterized by destruction of the cancellous bodies of the vertebræ and intervertebral discs, leaving the front parts of the vertebræ to settle together and produce posterior angular projection; it is called also tuberculosis of spine, caries or osteitis of spine, posterior angular curvature, antero-posterior curvature, spondylitis, etc.

The ulceration and destruction of the bodies and intervertebral discs may be partial or complete: the process may begin in either structure, and it usually terminates in ankylosis of the affected joints. Usually the disease begins in ulceration of the cartilage, and the adjacent surfaces of the vertebræ suffer from caries and necrosis. When the bodies of the vertebræ are the first to be attacked, they suffer from primary necrosis, which seems particularly liable to attack cancellous bony structures. The disease spreads to involve a greater or less amount of the anterior portion of the spine, destroys it, and causes the characteristic posterior projection. This is most characteristic as angular curvature when it occurs in the middle

dorsal region, the long spines causing the peculiar angular appearance. But in the cervical and lumbar regions merely an obtuse posterior projection obtains on account of the shorter spinous processes in these regions. Even this amount of curvature may be absent in well marked cases.

Pott's disease is most usual in children between three and ten years of age and of a tubercular diathesis, but all ages and conditions are subject to it. It seems to be fairly rare.

The AETIOLOGY of this disease is particularly interesting to the Osteopath for two reasons: 1. It introduces the germ theory. 2. It emphasizes the importance of slight mechanical causes, e. g., blows, wrenches, or strains, etc., as factors, or rather, as original causes, in the production of disease.

The American Text Book of Surgery states that while slight traumatism is usually the cause to which the disease is ascribed, the tubercular diathesis or soil is essential to the production of the typical disease. Quain, however, lays more stress upon violence as the cause, and states that frequently cases are met with whose family history is free from scrofula, and Farnum, in a text of April, '98, says that the microscope fails to reveal the tubercle bacilli in but a few cases. Thus the doctors disagree. Cases are frequent in children after diseases such as whooping cough, measles and scarlet fever, in which the constitution is weakened. In the adult, syphilis and rheumatism predispose to the disease, as they affect the joints.

The direct cause seems to be generally some violence. Quain, speaking of cases in children of good family history who had never had any sickness, says: "In such cases we can hardly doubt that some slight accident met with in boisterous play, must have been the immediate cause of the disease; and in some instances the writer has obtained undoubted evidence of this fact." He also mentions such a cause as the strain upon the spine occasioned by a man, in sport, catching a child by the arms, and swinging him around upon his back. The violence of course may be direct and severe, as in bad falls and blows. The Osteopath continually emphasizes the importance of such injuries as causes of disease, through the effect they have upon the spine, not so often in producing curvatures, but in producing unnatural conditions in the spine, which interfere with nerve force and cause various diseases. What others forget he strives to remember, and frequently is sure that some old injury, either unnoticed or long forgotten, is the source of present ill. Frequently the patient will recall such causes.

AETIOLOGY:—*Constitutional*—e. g., syphilis, rheumatism, scarlet fever, measles, whooping cough, etc., tuberculosis, scrofula; *External*—local violence, direct or indirect.

PATHOLOGY:—Caries and necrosis, ulceration of discs and formation of the angle have already been noted. Further consideration of the

pathology raises additional points of significance to the Osteopath. The inflammation of the parts may effect the cord itself (myelitis), causing paralysis which varies according to the region of the cord affected. Or, the inflammation may cause what is known as inflammatory pachymeningitis, i. e., a thickening of the fibrous tissues between the dura-mater and the walls of the spinal canal. Their growth may occur only along the anterior, pressing upon the anterior part of the cord and the motor nerve roots, causing motor paralysis. This is the most usual condition, but the growth of tissues may affect both anterior and posterior parts of the cord, causing both motor and sensory paralysis. Sequestra are formed (portions of the bone eaten off and surrounded by fibrous coat), or deposits occur and bring pressure upon the cord. The same may be caused by the dislodged vertebrae, or by narrowing or obliteration of the canal. These causes, of course, irritate the nervous mechanism, and pervert or suspend its operations, e. g., the irritation may be upon a certain center, be transmitted from cord to sympathetics and affect any important organ or organs in their vital operations. These are the reasons for the great pain and distress and the very bad general health noted in a patient with Pott's disease.

Just so the Osteopath in any ordinary case lays great stress upon any strain or injury to the spine. 1. Strain followed by inflammation and thickened tissues. 2. Hyperaemia affecting centers. 3. Slips or twists of vertebrae causing direct pressure, or act as strains. 4. Deposits irritating centers, etc. 5. Rheumatic affection of the joints. All these affect nerve mechanism, reach the sympathetic system usually, and have far reaching results. This is shown in its worst form in Pott's disease. The muscular rigidity seen in Pott's disease is due to deep irritation of the nerves acting reflexly upon the muscles.

Symptoms: Variable, according to part of spine affected. The early symptoms are ill-defined (first six to nine months), making diagnosis difficult, but the patient lacks energy, is irritable, not well, poor vitality. There is pain upon motion and upon percussion of affected parts of the spine. Muscular stiffness and rigidity become prominent on account of irritation of nerves; patient makes unconscious efforts to shield the part from pain. The muscular stiffness causes characteristic attitudes: cervical, wry-neck; upper dorsal, neck pushes forward, chin raised and shoulders fixed; lower dorsal, military attitude; lumbar, lordosis, by contraction of the psoas muscles. Abscesses following along the psoas may contract the thigh and cause the case to resemble hip-joint disease.

While the chief deformity of Pott's disease is spinal curvature, this feature may be absent in cases where the disease develops late in life. A slight lateral sweep of the curve may occur, indicating destruction of the lateral portions of the vertebrae. Secondary curves are formed, e. g., dorsal kyphosis with lumbar lordosis. Quain notes two points at which

may occur a spurious form of posterior curvature, i. e., seventh cervical and first dorsal vertebræ, also eighth and ninth dorsal vertebræ, naturally prominent points. This condition being sometimes exaggerated, accompanied with pain. This is not real curvature. The former (seventh cervical and first dorsal vertebræ) is often noticed in hysterical girls.

Pain is an important symptom, being both local and distant, being roused locally by percussion. Yet the patient complains but little of pain along the spine, it usually being referred, e. g., in cervical disease to the throat, neck and arms; in dorsal disease, to the chest, intercostal and epigastric pains, coughing and palpitation of the heart; in lumbar disease the pains are colicky, the bladder is irritated and pains shoot down the lower limbs. Motion increases the pain, e. g., turning, jumping or pressing down the head. This fact causes the patient to hold the spine as quiet as possible. The pain, not usually acute, becomes sometimes lancinating. Some few cases run a slow course, it is said, with but little pain. Paralysis is a frequent symptom; may affect the lower limbs, or the sphincters. On an average it lasts from one to three years. Peculiar attitudes constitute another important symptom. The patient goes about supporting himself upon some object, e. g., furniture. If the disease is cervical or upper dorsal, he rests the chin upon the elbows, if lower, he rests the hands upon the hips, or walks about with body bent and hands supported upon the knees, always with the effort to relieve the affected portion of the spine of the superincumbent weight of the body.

Abscesses are frequent. They occur as retro-pharyngeal, dorsal, iliac, lumbar, or psoas abscesses, being the products of suppuration following the ulceration and destruction of the parts. The pus gathers in the sheaths of the muscles and comes to the surface at the points named. Osteopathy, if used in time, should prevent their formation or cause them, where small, to be absorbed.

There are with Pott's disease, general constitutional disturbances, asthma, heart disease, indigestion, abnormal temperature (99° to 100° F), fretfulness, chills, loss of appetite, cold extremities, etc. The disease, if left to run its course, terminates in bony ankylosis of the affected joints, and cure, with permanent deformity as an essential of such cure, or it ends in death from paralysis, myelitis, and general ill health.

Mortality in children 1-20; in adults 1-5. Thus the prognosis is more favorable in children than in adults, and unfavorable in proportion as the disease progresses rapidly.

LECTURE II.

LATERAL SPINAL CURVATURE:—SCOLIOSIS. This is perhaps the most common form of spinal curvature, and is, fortunately for the patient, often cured by Osteopathic treatment. By far the larger per

cent. of the cases coming under my supervision have been lateral curves. In lateral curvatures, called also, Scoliosis and Rotary Lateral Curvature, the spine describes two or more lateral curves, according to the American Text Book of Surgery; other texts do not thus imply the invariable presence of the secondary curve. I have seen cases in which there was but one lateral deviation. The rule, however, is to have a second lateral curve with its convexity in the opposite direction, while there may be three, or even four, or five curves, each compensating the other. I am treating a case at present in which there are two; there has been a third, but that has been straightened out. That was in the lumbar region. The primary curve was in the dorsal region. There was one up in the cervical region as well. Another case, which I might treat as similar, was one in which there was a very bad curve in the neck, followed by a very marked lateral curvature between the shoulders.

Practice of Osteopathy: Idea of Compensation:—Curvatures caused by tilting of pelvis, or dislocation of hip. I believe I spoke of this matter of compensation the other day. That is, nature is undertaking to restore the equilibrium of the body which is lost by the formation of one lateral curve, and this may be further carried out in the pelvis or in dislocation of the hip. I had a case of dislocation of the hip on the left side which had been followed by lateral curvature in the lumbar region toward the right, making a sort of compensation in that way. Again, I had a case in which there was wry-neck. The neck bent to one side and even that seemed to change the equilibrium, throwing the weight on the opposite side on the sacro-iliac ligaments. You see how badly such a case may affect equilibrium of the spine which is so delicate, and thus cause a change in the parts to meet the new conditions.

Lateral curvature is said to be more frequent in girls than in boys, and frequently it is so slight as to be unnoticed until discovered by accident. I had a case not long ago in which there was a marked lateral curvature to the left, taking in most of the spine from the cervical region down. They told me that they had not noticed the curvature coming on until it was pronounced, and you will find that so in quite a number of cases.

Actiology:—The causes of the disease may be local, e. g., faulty position; constitutional, e. g., rickets; or both. The most usual cause seems to be weakness, the spinal muscles giving way more on one side than on the other, allowing the spine to sag. Such weakness is often apparent as the result of rapid growth or of sickness. Dr. Harry Still had a case in which the patient had a very tender spine, and we found after we had been treating him for some time that he had a slight curvature. These things arise sometimes without apparent cause. For instance, I knew a young man in splendid health who had a marked lateral

curvature. He had had no bad accident or apparent cause. It seemed in his case to be simply due to very rapid growth. He was over six feet tall. It seems that the system is not always able to stand the strain put upon it by rapid growth. I had another case exactly similar.

A habitual faulty position, as in sitting at a desk, or holding an infant always on one arm, will frequently cause it. Carrying a heavy weight, as school books, or a heavy child, may become a cause. I knew of a young lady who carried her heavy infant brother about. Without doubt this was the cause of her trouble.

Obliquity of the Pelvis:—I noted a case of a young girl with the left hip dislocated upward, the curvature of the spine taking place with the convexity toward the right in the lumbar region, as a compensation. As far as I was able to learn the curvature was caused in this way, as the mother did not know that it had occurred until I pointed it out. Unilateral muscular atrophy, or hypertrophy, or muscular spasms from a central cause will all act as causes of lateral curvature. A rickety condition will also weaken the spine and cause this curvature, as will empyema, through muscular fixation of the affected side. I have known several cases in which the curvature came on without apparent cause, previous illness, or anything of that kind. I noted the other day a case of a young man who developed lateral curvature and had, following that, locomotor ataxia. His case came on without apparent cause. Quain assigns heredity as a predisposing cause.

ANATOMICAL CHARACTERS:—The spine does not simply yield laterally, but the bodies of the vertebræ turn so that the anterior aspect of the body of the vertebra comes to look laterally in the center of the curvature, having described the quadrant of circle. The transverse processes project anteriorly and posteriorly; the spinous processes, laterally. The bodies turn outward so as always to be upon the convexity of the curvature. The transverse processes are anterior and posterior, the spinous process is laterally in the opposite direction from the body of the vertebra. You see that you have a great change in the condition of the spine. The discs, as well as the bones, become everted away. You have a condition of changed form of bone, ligaments and muscles. I think that this will well illustrate to you what we have to deal with in case of lateral curvature. The relations of the ribs are changed, bulging backward at their angles on the convex side, carried forward on the opposite side, and making a deep depression along the concavity of the spine. On the convex side the ribs become much more oblique than before; on the concave side, more horizontal and wider apart. The bodies always deviate more than the spinous processes, and thus you see that you have a condition that is not fully indicated by the alignment of the spinous pre-

cesses, so do not be misled. Quain does not consider the deviation of the spines any sign of a curvature.

PATHOLOGY:—The bones, ligaments, muscles and vertebrae all undergo a pathological change during the course of the disease, accommodating themselves to the new formation of the parts. The intervertebral cartilages become compressed on one side by the unequal pressure, and assume a wedge shape, the thin edge of the wedge being toward the concave side. Pressure and absorption also gradually alter the shape of the vertebrae and of their articular processes. You readily see what a strain comes upon these processes, and the facets gradually wear away, facing another direction, instead of back and up. So you see how extensive the change is. The vertebrae become more or less wedge shaped, while the direction of the faces of the articular processes become changed. These structural changes confirm the condition of the curvature and make it more difficult to cure. If a man comes to you and wants to know how soon you can cure a lateral curvature, you will have to tell him that the case is such that you will have to alter even the shape of the bones before you can effect a cure.

Late authorities describe the muscles and ligaments as relaxed and atrophied on the convex side, and contracted and strengthened on the concave side. Quain disagrees with this, stating that the muscles are simply displaced on the concave side, pushed together and thus apparently contracted. You can readily see how this could be. The muscles and ligaments are weakened on this convex side, and become atrophied because pushed out of place, while these on the other side will become contracted, because it is a rule that if you approximate the points of origin and insertion of a muscle it will contract to conform to the changed position. Quain says they are simply pushed over and in that way apparently contracted, while the later authorities say that there is a distinct change of condition on this side.

Anteriorly the sternum becomes very oblique, and the cartilages of the concave side bent upon themselves. The thoracic and abdominal organs are displaced and interfered with, often causing organic troubles.

The lung on the concave side is compressed; the heart may, in some cases, be displaced to the right side; the liver and stomach and intestines are forced downward; while the kidney and spleen on the convex side are said to be usually smaller than on the other side. In cases of a rachitic character there is often deformity of the pelvis.

Symptoms:—The curvature is often so slow in development that it remains unnoticed for a considerable time, being noticed first in fitting clothes by a dressmaker, or sometimes, in case of a boy, the suspender slips off the shoulder too easily, or one scapula is a little too prominent, or some slight irregularity in the patient's gait is noticed. One shoulder

is higher. If on the left (left deviation), the right breast and iliac crest will be slightly too prominent, the curve of the waist deeper on the right, and the distance from the right axilla to the hip shorter. That is one place where you may make a valuable measurement. I would advise you always in these cases to make measurements. I have a case of very marked curvature, extremely to the right; on the left side the hip is up so that the ribs as high up as the sixth or seventh rib fall down over the crest of the ilium. That is one of the most marked cases of curvature that I have seen, and was caused by a fall from a swing. Quain states that the diagnosis cannot be made simply upon the lateral deviation of the spine, since this often occurs in weakness or in hysterical conditions. The diagnosis must rest upon the torsion of the vertebræ and changed direction of the transverse processes.

Symptoms of nervousness, palpitation of the heart, shortness of breath, indigestion, etc., are often present, as are also indisposition to exercise, vague feelings of discomfort, and pain and tenderness in the back.

Suspension will cause the curve to disappear in mild and short time cases. Those which do not thus disappear have become strongly fixed. If the curve persists until maturity, it as a rule remains throughout life. Osteopathic experience is contrary to this. I might say that cases of people well advanced in life have been rendered fairly straight, although it seems that maturity has limited our practice somewhat in that respect. It is also stated that the prognosis is unfavorable in proportion to the youth of the subject when the curve begins. Here also Osteopathic experience is at variance with the authorities.

A double curvature is likely to be self-limited, by the arms of the "S" reaching equality and establishing an even balance. Thus, if you have a curvature occurring first in the upper dorsal or in the cervical, you are liable to have a curvature on the other side lower down, since nature has to restore the equilibrium. Thus a curvature is apt to be self limited, not self cured, but more curves may appear, as you already see. The long single curve is apt to lead to the greatest deformity. The great majority of cases reach a certain stage, become stationary, and pass through life with slight deformity and but little trouble from the curvature. In some cases, however, progressive deformity leads to immense distortion.

HYSTERICAL CURVATURE:—A form of curvature described as a lateral curvature which may be made to disappear by causing the patient to bend forward until the tips of the fingers touch the ground.

KYPHOSIS, or posterior curvature, is a term used to describe the common condition of round shoulders, as is usually found in the upper dorsal region. The same term, however, is descriptive of ordinary posterior

curvature of any portion of the spine, but not of Pott's disease, commonly, though sometimes used as a synonym for that term. Its causes seem to be, in general, those which have been described for lateral curvature, viz.: faulty position, weakness and debility, paralysis, ricketts, etc. For example, it is found in infants who have been allowed to sit up too much; in growing girls who sit in bad positions at school or at the piano; in professional men who bend over desks; or in bicycle riders who assume an extreme position. Old age and debility weaken the muscles of the back, and allow the spine to bend. Years of hard work, e. g., as in miners, shoemakers, etc., is also a cause. Sometimes it is the result of positions assumed to ease pain, as in asthma, metritis and rheumatism.

Pathology:—The chief features are a relaxation of the spinal ligaments at the spot affected, allowing a protrusion of the spinous processes, and a separation from each other; an approximation of the bodies anteriorly, resulting in destruction of the edges of the intervertebral discs and of the bodies of the vertebrae from pressure atrophy. In old age, ossification of the joints may have occurred. The stature is diminished. It must be distinguished from Pott's disease by the rounded, instead of the angular curvature; by the absence of muscular rigidity, tenderness, pain and symptoms of involvement of the cord.

It is stated that infants usually recover from the disease spontaneously; children generally recover upon exercise. If present at maturity it remains during life, but amounts to but small deformity in the adult. If occurring late in life it is apt to be progressive.

Lordosis, or anterior curvature, is rather rare. It is usually in the lumbar or in the dorso-lumbar region, often being the secondary curvature in Pott's disease. In this affection the hips are prominent behind, and the pubes is depressed, showing a tilting of the pelvis. The causes are commonly, weakness of the muscles and ligaments of the lower portion of the spine, as in ricketts and paralysis. Great weight of the abdomen, as in ascites or pregnancy, and in persons with a naturally large or fatty abdomen, seems to be the cause of the trouble. It is met in certain diseases of the hip in which the joints are partly flexed. Structural changes occur in the nature of relaxed and lengthened anterior muscles and ligaments, the reverse being true of these posterior structures. Also there is a change of form in the vertebrae and intervertebral discs. They become wedge shaped by pressure atrophy, with their thin edges backward. After maturity the deformity is apt to become permanent, but in many cases disappears in a few months.

LECTURE III.

To-day I wish to illustrate the TREATMENT OF SPINAL CURVATURES. In treatment of spinal curvature we should consider first the theory, and second the practice. The description of theory might be divided into first, the mechanical work purely. We have to do a certain amount of mechanical work upon the spine. Parts are out of place and just as you would pile up a pile of blocks that have been knocked over, it is a mechanical matter to readjust all of the parts which are out of place. That part of our work is purely and simply mechanical. You might pile up a pile of lumber, but if you want to be sure of its remaining so, you will have to put supports about it, hence we will have to do something more than simply put parts back mechanically. The muscles and ligaments must be strengthened and stimulated to hold them in place. Since the muscles, ligaments and vertebræ are affected by blood and nerve supply, these parts in the normal spine are retained in position by free and unobstructed supply of blood.

We retain these parts in place by strengthening and stimulating the nerve and blood supply so that the ligaments, muscles, etc., are kept in proper condition.

First, then, as to the mechanical work. Its purpose, as already indicated, is to return parts to place, but we cannot separate these methods of treatment, the strengthening and stimulating must be used together with the replacing of parts. Not only are the vertebræ out of place, but they are changed in form, they have become flattened on one side. It is going to be a difficult matter to hold them in place. You must take that into consideration in building up the spine. These parts slipped back mechanically are not going to stay, the first, second or not even the third time. You will have to keep at work on them, return them to place, and keep strengthening the ligaments in order that they may be held in place. How can you shape the material so that it will stand in this delicate column? That question we have to deal with in any spinal curvature. A word as to theory. We must build up and restore lost parts. Tension or suspension as you may readily see, tends to the alignment of the vertebræ. You know how we get this effect upon the spine. You can have some one holding the ankles, and you can exert a great deal of *traction upon the spine*, under ordinary circumstances, without danger. However, I have known cases of spinal curvature where the patients were rendered bed-ridden by stretching in this way, so you must be very careful. You must judge how much the patient can stand. This method of traction is one of the best methods that we have, for reasons that I shall show you later as to the theory; but you see how it is accomplished, with the patient lying upon his back and

with the "straight pull." It can also be done in this way; you may have the patient sitting (it is particularly good for small children), having the hips held down, and raising the upper part of the body by reaching over and raising the weight at various points along the spine, from below upward, thus stretching the spine all the way along.

There is a method frequently used by surgeons in spinal curvatures. The method is simple and readily shown. You have a suspensory apparatus consisting of a bow of steel with two hooks on either side, and with a ring on the top to hang it up by. From the inner hooks are straps leading to the collar which buckles under the chin. On the ends of this bow you have straps descending with supports for the arm. There you have your patient suspended, pulled up with a pulley. His feet are free of the floor and you have the weight of the body then all hung from the point of the greatest curvature, since upon that point comes the greatest traction. That is one of the common methods used by surgeons in the treatment of curvatures. I knew it used in one case by an Osteopath. It seemed to be very good. The case was a very bad lateral curvature. The stature of the patient was increased about three inches in a month, some students are trying this method now. I, myself, have not tried it.

Besides that you can use this motion which I have already shown you. Have the patient sitting with his back toward you; his hands clasped behind his neck. You then reach under the axilla, and grasp the wrist on each side, then you push the head forward against the resistance of the patient, and stretch the spine back in such a way as to bring tension along the spine. I think that is a very good movement. The tension that is exerted in this way is one of our valuable methods of treating spinal curvature.

Another way is to work from the spine, springing the spine toward the concavity. Where the spine is deviated laterally I would have the patient lie upon the side with the convexity upward. I can then work against the convexity, forcing the spine toward the concavity. The muscles on the uppermost side of the body are almost entirely relaxed. I, standing in front of the patient, reaching down upon the vertebræ, bring pressure upon the spine. I usually push the shoulder down toward the curvature and spring the spine. I find this method very good indeed. You can work from above downward, or from below upward.

Our second method, then, of mechanically working the spine back into place, is to spring the spine toward the concavity. Another way is to work against the ribs. They being attached to the transverse processes of the vertebræ by ligamentous bands, may thus be used by their connection to some extent to force the vertebræ back into place. Doctor Still one day showed me, in a certain case, this motion: having the

patient upon the side with the convexity upward, he reached over so that the thumb of the left hand was upon the angles of the ribs on the lower side of the body, the fingers of the right hand were against the angles of the ribs on the upper side. He then spread the ribs, springing the upper ones, upon which he was working particularly, down and then upward; having sprung them down to release them from the transverse processes and to stretch the ligaments; and then upward. This helps the ribs which are more or less displaced, and also helps to draw the vertebræ a fixed point.

Another way is to have the patient sitting. This method is especially good in cases where the curvature is high up between the shoulders. Work against the ribs in front. You can press with the knee against the anterior ends of the ribs, and draw the arm up in such a way as to bring tension, thus exerting such a pressure upon the transverse processes of the vertebræ behind as to help bring them back into place. You should be careful and not press hard at the knee, the ribs being joined to the sternum by cartilages which may be ruptured. Use the knee merely as a fixed point.

Another motion that I use; having the patient sitting upon a stool, I reach under the arm to the angles of the ribs on either side, and then turn the patient from side to side, lifting the superincumbent weight off the vertebræ and springing the spine back toward the original position. Not only do I hold on each side against the angles of the ribs, but I may, releasing one hand, and grasping the arm, reach over the spinous processes, and thus twist the patient around, get a great deal of force exerted against the spinous processes. This is a mechanical manner of springing back into place that which is misplaced. Further, you may with the patient sitting, stand on the side, thrusting your hand under the axilla on the opposite side, you can thus raise the weight of the patient's body to a considerable extent. I thrust the thumb against the spinous processes, and working with this twisting motion, make the thumb a fixed point and spring the vertebræ back. You can work up and down the spine in that way and tend to bring the vertebræ back to position. You will notice a great difference in spines. Some are quite mobile, while others are as stiff as iron, and it is very difficult to move them. It depends upon the case. Another point which Doctor Still lays stress upon, is to begin at the bottom of the curvature and work upward; the idea being that the lower vertebræ are larger than those above, therefore more stable, and you can work better than from above downward. This may not be an invariable rule. You should have a purpose in your work along the spine. If every day you attempt to replace one vertebræ you are working with a definite point in view. Do not simply work up and down the spine. Fix your attention upon a single vertebra each day

and try to restore it to position. Working from it up you will succeed better.

Q. If there were several vertebræ out, would you only work upon one each day?

A. I would give these general treatments described for the general help it would be, but I would direct my attention particularly to getting one back into position, though I would not work on one alone.

Reduce the secondary curvature first, because it is later in date, and as a rule less in extent. Therefore it is more amenable to your treatment and more readily restored. You will find that the secondary curvatures yield first. Those which come first, as a rule are more difficult to restore.

I would first remove any appliances which may have been put on in the shape of stays, braces, etc., to allow free motion, freedom of exercise, and the free flow of blood. The removal frees the patient from the irritation which these appliances cause. I do not say this simply to condemn any other practice, but it is our practice to remove them to get the spine to depend upon its own strength. So much then for the purely mechanical theory of our work.

Q. By putting the lower vertebræ back into place, would that have a tendency to throw the one above back to some extent?

A. Yes, sir, as far as you could within limits. The whole tendency is to work the one above back with the lower one. You cannot work upon one of the vertebræ entirely independently of the others. That is more a plan of work. Work with the intention to restore first one and then the other.

I hardly need to illustrate what I am about to say in regard to stimulating. You must thoroughly relax all of the muscles along the spine, having the patient upon his face. Stretch the muscles and stimulate them.

Further as to theory. You remember I have spoken of the central distribution of the sympathetic nerve from the ganglia, supplying the ligaments, the vertebræ, dura-mater, bones and vessels. I mean the blood vessels going to the muscles, cord, etc., and supplying all of these structures that we work upon. We are not simply relaxing muscles, but we are acting upon the sensory peripheral terminals of the nerves, getting the effect through them. The action upon the sympathetic thus influencing the sympathetic centers, we get the effect upon the spinal column. That I bring out as a point of theory particularly concerned in our work upon the spinal column. Remember that the ligaments and muscles are holding the parts of the spine in place and depend for strength upon proper flow of blood to them, consequently when you are working upon blood supply your work is primary.

Now a word as to the theory connected with the good of bringing traction upon vertebræ by a straight pull, or in the other ways shown. Tension spreads the vertebræ and allows the free ingress of the blood to the discs and all of the structures concerned. These have been pressed out of shape. What you wish to do is to so separate that the blood can be thrown to the parts. The effect that you will get is to allow the tendency toward the normal to restore parts to normal shape and condition. So there is one important point in theory as to why we bring the straight pull upon the vertebræ. Thus the vertebræ and the discs are to be built up. You will not have a straight column or a strong spinal column until that has taken place.

The process of ulceration and suppuration may be stopped in Pott's disease, so that you may prevent the posterior angular curvature if you get your case in time; prevent the fixation of the joints. These remarks apply to all the work of stimulation of blood supply along the spine. We, thus by all of these means, increase blood supply, strengthen muscles and ligaments, and cause them to hold the ground regained by holding replaced parts in place. Of course you cannot always have parts stay where you put them. It is, therefore, a process of growth. You must bear in mind when a patient comes in with spinal curvature, that to cure it will take time. It must be slow and natural. This will enable you to explain in a great many cases to patients who desire a short period of treatment and expect to be cured.

Spring the spine both ways. Placing the patient upon the side, I spring the spine toward me, then with the patient upon the other side I spring the spine again. You may suppose that you should spring the spine only toward the concavity, but the theory is this, that in springing toward the concavity, then springing away, you get the effect of the recoil. Then you must pay attention to the general health according to the symptoms that you encounter. There are various complications of the heart, lungs and internal viscera, or there may be general symptoms, and you must direct your treatment accordingly.

Appropriate exercises are good. If your patient has a curvature in the lower dorsal region, anywhere below the shoulders, he can hang upon a horizontal bar by the arms. It is a good exercise for any one. We are always shorter in the evening than when we get up in the morning. It is good practice, this and other appropriate exercise, to strengthen the general health and strengthen the muscles of the back. This, of course, is not Osteopathic practice, but it is exercise which is useful in aiding you in your treatment.

I might say further that the lateral curve between the shoulders is perhaps the most difficult, and in addition to general stimulation which we give the spine in that region, by working the muscles and springing

it from side to side, I have a motion which I think is very good, and which I illustrate in this way: The patient sitting upon the stool, and I standing at the back, have the thumb of one hand pressed against the spinous process of the vertebra on the side toward the convexity, and I push the head around toward the opposite side, at the same time pressing the thumb upon the spinous process back toward the concavity, and drawing the head around away from the concavity. This method I have found to be one of the best for reducing curvature between the shoulders, as well as reducing the dislocation of a single vertebra. I think that what I have said you may readily apply to the lower dorsal and lumbar curvatures and secondary curvatures without my saying anything more now.

I will speak a few minutes as to the results. In the first place, in Pott's disease, very many cases have been helped where they have taken treatment soon enough, and in advanced cases you can do a great deal of good. In advanced cases I have been able to relieve fever and nervous symptoms and general symptoms from which the patient was suffering, by ordinary work along the spine. Often the patient is very weak and you must be careful to not treat strongly. There is one patient that I treat very little, scarcely any at all, but I reduce the fever, and the patient is always relieved.

These cases if taken in time, may be saved from deformity by preventing an angular curve. Where the abscesses have not entirely formed they may be prevented, and the pus may be absorbed. I knew of one case greatly deformed where the symptoms were all relieved, and the patient has been enjoying fairly good health ever since. If you get a case early, good results generally follow.

Kyphosis, posterior curvature, and scoliosis, lateral curvature, in favorable cases are cured. Even where we have not been able to effect a cure, we have been able to prevent further progress. We have been able to change the distorted parts to normal even after maturity, but the early cases give the most gratifying results. This may be accomplished in posterior and lateral curvatures.

We must recognize our limitations. We cannot cure everything and there are many cases that we cannot help. We are limited, but we have been able to cure a great number of cases. Osteopathy has been able to cure more cases than any other system.

A few words as to the methods used by surgeons. They are, in spinal curvatures chiefly mechanical, with prescriptions of drugs for general health. One practice in very general use is to have the patient lie flat upon the back to relieve the spine of the weight of the body. Sometimes a bed frame is made in this way: an ordinary iron pipe is made into a rectangular frame long enough to accommodate the patient,

and a cloth is spread over it and fastened, making a fixed, firm place upon which to lie, and which may be readily taken up. There are various appliances which are used. Plaster paris jackets are made. The patient is suspended upon a frame and bandages are applied as near the skin as possible, to a perfectly fitting under vest. Sometimes these jackets are cut in front and laced so they may be taken off, but generally they are left on. Leather and wire jackets are made, and ingeniously contrived and elaborately made braces of great price are used. Objections: All jackets, etc., limit motion, prevent exercise, are often unsanitary, impede blood flow. Braces often do not fit and are outgrown. Mechanical supports do not allow the weak parts to grow strong. Such contrivances irritate nerves and often perpetuate the condition they should cure. Of course the parts cannot be built up and strengthened, because they are depending upon something else. As a rule we remove these things, and leave the patient to have freedom of motion.

Sometimes they have the patient assume a position that will correct the curvature. There is a seat called Volkman's seat, with the chair seat raised upon one side, and the patient sitting thus, stops the curvature by overcorrection. They also have the patient lie down on a table, in such a way as to bend the spine. There are various methods used.

LECTURE IV.

TYPHOID FEVER, (Enteric fever, Typhus abdominalis), is described as an acute, infectious (but not contagious) disease. I treated a case once where the lady next door had bottles of carbolic acid set along on the window sills. A great many people are afraid of it and think it contagious. It is a long continued fever, characterized by certain lesions of the small intestines, which are the seat of the disease.

Aetiology. Its cause is now generally held to be a specific micro-organism, the Typhoid bacillus, or bacillus of Eberth, which invades the body and propogates its peculiar poisons, thus infecting the patient and causing the symptoms of the disease.

Contaminated water is the chief avenue of entrance of the germ into the body. Not all bad water is thus a carrier of disease. People often use such water with impunity. Countless millions of the bacilli exist in the feces of the typhoid patients. These are frequently and criminally allowed to go without disinfection by a good germicide. The water in the soil frequently becomes contaminated with sewage, which finds its way into wells or rivers, and thus into the houses in the drinking water. A heavy, washing rain, in a town or village not well drained by sewers,

will wash the germs into wells and cisterns; or the same heavy rain, cleaning up the large, well drained city, flushes its sewers, and carries its impurities into the river which supplies smaller towns below with water for all purposes. I knew of one case in which a little girl, some five or six years of age, in going home from school, stopped at an open man-hole in a sewer and played about it for a short time. She was very soon afterward taken with a very bad case of typhoid fever, and the cause was laid to her playing about the man-hole of this sewer. Such effects may occur.

Cold does not kill the germ. Impure ice is often the source of the infection, as is also adulterated milk and other articles of food. The ice which has been used here I think has been the cause of a number of cases, although I do not know that it is so much so at the present time.

Typhoid fever is not contagious. Clergymen, physicians and nurses rarely contract it. But this accident sometimes happens in houses where cleanliness is not observed in the matter of bed clothing, carpets, linen, etc. Quain states that emanations from newly opened cesspools, sewers, etc., may cause the disease, rarely however, through atmospheric contagion. This theory, I believe, is now held to be untenable.

It becomes at once evident that great care should be taken to disinfect the stools and urine, and to adopt antiseptic precautions in washing the linen.

Typhoid usually occurs epidemically in the Autumn (August-November), but in cities sporadic cases are continually noted at any season.

Some people never take the fever, seeming to be immune. It is stated that heredity seems to predispose to an attack, it being more formidable in a patient who has lost a parent by the disease. One attack does not exempt from another. Young, robust adults are most frequently the victims, the disease seeming to avoid persons with chronic ailments. It is very rare before one year of age, less so between one year and fifteen years; most frequent between fifteen and thirty years of age. Overwork, mental depressions, shock and general debility are predisposing causes. So it is that the child of a parent who has had a bad case of typhoid fever may die from the disease. Thus it is that the child, or the brother, or sister who has watched at the bedside of a patient dying with the fever may have the disease. The shock of the loss of the relative weakens the system, and the patient is taken down. Such cases occur very frequently, and without doubt it is the mental shock which is the predisposing cause.

Typhoid fever is a disease of the small intestines, and affects chiefly Peyer's patches, hence the name *Ileo-typhus* sometimes applied to it.

Four stages are marked by the condition of the mucous membrane of the small intestines,

(1) In the *congestive stage* the whole membrane is swollen and congested, covered with a slimy exudation.

(2) In the *stage of infiltration*, the swelling concentrates upon Peyer's patches, disappearing in other locations. The patches swell and become of a grayish color.

(3) In the *stage of softening*, the glands burst and are covered by a crumbly crust, or burst and discharge without formation of crust.

(4) In the *stage of ulceration* the patches suppurate and form the *Typhoid ulcer*. The whole gland may now be sloughed off down to the sub-mucous fibrous coat of the intestines, or the muscular coat may be eaten through, and perforation of the bowels takes place. Blood vessels may be eroded, resulting in hemorrhage. While the ulceration as a rule affects the Peyer's glands, the latter may be wanting, or little affected, while numerous small ulcerations are scattered over the intestines. The large intestine is rarely affected; the ilio-cæcal valve marking the limit of the disease. The mesenteric lymphatic glands become infiltrated and enlarged. The parenchyma of the liver and kidney, the muscle fibers of the heart, and the involuntary muscles generally, may undergo granular degeneration. From this cause heart failure may become a complication.

Symptoms: The period of incubation, in which the germ grows in numbers and gains a foothold in the tissues, is usually about two weeks, but it may vary to four. The onset is usually insidious; for a few days before the attack, the patient suffers from: headache, malaise, general weakness, dizziness, nose-bleed, pains in the back, loss of sleep and appetite, coated tongue, etc. The attack proper is ushered in with a chill and vomiting. The chilly feeling may be slight or wanting. In typical cases the bowels may be relaxed, and diarrhœa be present, though often constipation is present. There is gurgling and tenderness upon pressure in the right iliac fossa. The attack may come on violently with few prodromal symptoms.

An almost unfailling sign of typhoid is the temperature variation, so characteristic a course does its rise and fall pursue. During the first week, roughly speaking, it rises until it has reached 103 to 105 degrees F.; for another week, or week and a half, it remains high; then for a week to a week and a half it gradually descends. The manner of rise is as follows: for the first four or five days the temperature increases from two to three degrees, with a fall of one to one and one-half degrees F. from evening until morning. After reaching its level, it remains about the same, the morning temperature being about from one to one and a half degrees lower than that of the evening. During the period of decline the morning fall exceeds the evening rise, until the normal is reached.

While the temperature is almost invariably characteristic, it has been known to vary some from the usual course.

Another important diagnostic sign is the rose-colored rash. This appears about the end of the first week: frequently absent, estimated so in about thirty per cent of all cases. The spots are small, reddish, pale, about the size of the head of a pin. They appear in successive crops upon the abdomen, chest and back, lasting until the end of the fever. They disappear upon pressure. Individual spots may be observed by being marked about with ink. The spleen and liver are enlarged and tender.

The symptoms, usually spoken of with regard to the week of the disease, are in great variety, differing much in different patients. During the first week, in addition to the weakness, dizziness, epistaxis, etc., already mentioned, the abdomen becomes tumid, the tongue is soft and shows the imprints of the teeth. It is covered with a fine white fur which may become heavy, brown and flaky as the disease progresses. At first the edges of the tongue are red, frequently there appears a red streak down the middle, terminating in a wedge-shaped red space at the tip of the tongue. The pupils of the eye dilate. During the second week the temperature keeps about 104 degrees F., the pulse is weak, soft, often *dicrotic*, and varies from 100 to 200 beats; the face assumes a stupid look, the patient is very weak, lies upon the back, slips down in bed, following the weight of the body. There is a dizziness, ringing in the ears, a dry tongue, but the patient does not ask for water; drinks when it is given to him. He answers slowly when spoken to, shows the tongue with difficulty, mutters and is delirious.

In the third week the extreme weakness continues. The bowels are usually loose, owing to the catarrhal condition of the intestines, the cheeks are flushed or cyanotic, the lips and teeth are covered with sordes; the abdomen is inflated, and the dependent parts of the lungs solidified. The temperature is still high; there is a jerking of the tendons (*subsultus tendinum*), the patient slides further down in bed, and the stools and urine are apt to pass off involuntarily. This is the dangerous week, and the one in which the mortality is the greatest. Bed sores frequently appear at this time, and are to be carefully guarded against. The patient is stupid and delirious and may pick at the bed clothing. In this week the intestinal hemorrhage or the perforation of the bowels may occur. The former may not be serious, but the latter is usually fatal. They are often brought on by some indiscretion, such as the eating of solid food. The climax of the disease is now reached. The patient may die from perforation, hemorrhage, weakness, or some complication. On the other hand, all the symptoms may improve; the stupor become natural sleep; consciousness return; pulse and respiration become

normal. This continues during the fourth week, but the patient recovers very slowly.

Relapses are of frequent occurrence. They occur about ten days after the disappearance of the fever.

Hemorrhages are known by passage of blood from the bowels, nose or womb. The patient nears collapse and the temperature suddenly falls. Perforation is known usually by a sudden and intense pain in the abdomen, bloating (tympanites) and collapse. The patient lies on his back with knees drawn up. Peritonitis follows. The countenance is pale and wet with perspiration. The abdominal walls are motionless in respiration.

Complications are common, e. g., pneumonia, parotitis, pleurisy, and pulmonary gangrene. Various forms occur, e. g., Abortive typhoid, in which the symptoms are light, remission of temperature on the eighth to ninth day; walking or ambulatory typhoid, patient gets around, the symptoms are slight, but may suddenly terminate in perforation or hemorrhage.

Treatment of typhoid fever requires great care and careful-nursing.

1. *Liquid diet* must be strictly enforced from the onset until from five to ten days after the fever has gone. Milk, meat broths, and soup are indicated. The best is milk with lime water in it to prevent coagulation in the stomach. Milk or beef tea should be given about every three hours. From two to four pints of milk a day may be given

2. *Frequent sponging* (night and morning) with tepid water with a little vinegar in it should be employed. Hands and face should be frequently washed. Sometimes cold baths are given every three hours. The water should be seventy-five to eighty-five degrees F. and the body immersed in it for a few minutes, the body being well rubbed afterward to prevent internal congestion.

3. Bed pan and urinal should be used from the first, as the extra exertion of sitting up is a serious drain on the patient's strength. Patient should never be allowed to get up.

4. *Swab mouth* with a wash of equal parts of glycerine and water, with lemon juice added.

5. *Diarrhoea* unless excessive, more than from three to five times daily, should not be interfered with.

In constipation use anema every day or second day.

6. Keep feet and hands warm by hot applications. In case of relapse and sudden fall of temperature heat up well and quickly by hot applications.

7. Return to solid food very slowly. Not earlier than from five to ten days after the fever has left. In all treatment avoid carbo-hydrates. (starches, etc.)—such foods as are digested in the intestines. No fat,

etc. The solid food may be egg, lightly boiled or poached; very soft boiled rice, curds, and whey. Care should be taken as the patient always has a ravenous appetite, and there is great danger of over feeding.

8. Plenty of water—boiled—should be given. You may give toast water, barley water, etc.

The object of medical treatment is simply palliative, Hare declaring that the course of the disease cannot be shortened. However, Dr. Goltman, of Memphis, Tenn., in the *Medical Record*, New York, September 17, 1898, states his belief to be that early and rigorous eliminative treatment may cause a shorter or milder course by lessening toxæmia. In medical treatment as in Osteopathic treatment, great reliance is placed upon proper nursing, but the former indicates a long list of drugs for the various phases of the disease.

OSTEOPATHIC TREATMENT, if early and thorough, is highly successful, in most cases, generally shortening the course, and in most of the remainder keeping down the fever and the untoward symptoms that consume the patient's vitality. Dr. Conner, of much experience, states that he can usually have the fever broken up within two weeks. Dr. McConnell states that by early and radical treatment the course may be shortened to five days or less.

Q. Would it not be injurious to take the patient out of bed to give him a bath?

A. Not necessarily so, as he could be lifted out and back.

Q. How soon would you reduce the fever?

A. As soon and as much as you can. Of course it does not stay down, but we keep at it. We always make it a practice to keep it down as much as possible.

Q. How often do you treat a patient for typhoid fever?

A. You should go to see your patient two or three times a day, and make it convenient to go several other times to see if he is getting along all right. You should give at least two treatments a day.

Treatment Procedure by Osteopathy: You will find your patient very nervous, muscles twitching, and perhaps irritable. You can reduce the nervousness and twitching by carefully relaxing the muscles along the spine. I have the patient turned on the side, with as little effort on his part as possible, and relax all of the muscles along the spine on both sides. I do not usually put him to the trouble of being turned over to the other side. I reach over to the muscles on the under side. You can in this way get the effect on both sides, and the next time you can have him turned on the other side.

You will find that by treatment along the spine, and by gentle treatment in the neck you can usually quiet the patient. Treat in the neck at the superior cervical region. The idea is to get the hand flat against

these muscles which are drawn and sore, and gently turn the head to one side so that you can relax the tension. That relieves the tension and aids the blood flow. The spinal treatment and treatment in the neck are for these symptoms of nervousness. The theory is that we affect the posterior spinal nerves and get the effect through the terminal sensory fibres to the sympathetic nervous system, and out through it to the vaso-motor, and thus equalize the circulation. Our theory here of work upon the superior cervical region is that we reach the sub and great occipital nerves and the general circulation through the medulla, in that way quieting the nerves.

There are special points which are included between the second dorsal and the fourth lumbar. (a) From the second to the seventh dorsal to relieve the lungs, as you know pneumonia is one of the complications. (b) Work gently from the fifth to the tenth dorsal for the effect upon the jejunum. (c) From the tenth dorsal to the first lumbar for the ilium. We do the most of our work from the tenth dorsal to the first lumbar because the small intestine is affected. You may work from the first to the fourth lumbar to affect the large intestine. (d) From the sixth dorsal to the second lumbar to affect the kidneys. All your work along here must be very gentle. Work against the muscles gently, particularly from the tenth dorsal down to the fourth lumbar. I work gently, springing the spine all the way along toward me, as that will stimulate and relieve the nerves. The spleen must be looked after in the splanchnic region from the eighth to the twelfth on the left side. The ribs from the eighth to the twelfth on the left side must be raised gently. I would not take up the arms of the patient. I would reach under him and raise them. Work over the abdomen and under the ribs in front, not hard, as the spleen and liver are likely to be congested and you must not work hard on that account. In diarrhoea, where there are more than three or four stools in a day, we inhibit the ninth, tenth and eleventh dorsal, the eleventh especially, by holding against this point, the patient upon the side, and by springing the spine. I go also to the lumbar region, and hold at the heads of the eleventh and twelfth ribs. The theory there is that springing the spine and gently raising the ribs releases any tension upon the spinal nerves, and through them affects the sympathetics ruling the organs mentioned. Also treat gently the second dorsal and fifth lumbar to influence the superficial fascia and thus influence the general circulation of the blood; the cutaneous circulation.

Fever.—I take down the fever by work in the superior cervical region, as I have already shown you. I hold flat against the sub and great occipitals for a long time. Do not be in a hurry. You can hold there several minutes if you wish, and turn the head from side to side, gently. I also inhibit by springing the arm up a little, or by pressing in against

the heads of the upper ribs on the left side, from the first to the fifth to help quiet the heart. In extreme cases where the heart beat is from one hundred and thirty to one hundred and forty, Dr. Hildreth says he has had fairly good success by raising the fifth rib on the left side. I would work under the angles behind and raise both the angle and the tip. Also you will need to lower the first rib gently by pressing behind the clavicle.

The abdominal treatment is one that must be given very gently. We work in the iliac fossa on each side. I knead gently, not with the idea of helping the constipation, but of getting in deep among the intestines and relaxing the tension upon the lower hypogastric and pelvic plexuses, by a gentle touch to relieve the tension. Now, this work over the liver and spleen seems to relieve the tension, takes out the soreness, and thus probably, prevents the degeneration spoken of in the spleen, by freeing the blood flow, as well as prevents ulceration in the bowel. Probably also there is degeneration of the involuntary muscles of the heart, and as soon as you can do so you should give a stimulating treatment to restore the vitality.

Suppose you have a hemorrhage? Osteopathic treatment there would be as far as possible to inhibit the peristalsis, at the ninth, tenth and eleventh dorsal vertebræ. The best thing to do is to immediately place an ice bag over the cæcum to contract the blood vessels and stop the hemorrhage, while on the other hand, if you have perforation of the bowels, which is sudden, and may be noticed by the fixation of the abdominal walls, etc., hot applications are used over the bowels and lower limbs, to relieve the pain. If perforation occurs you are almost sure to lose your patient.

The patient's room should be quiet and clean, with good ventilation, plenty of fresh air, diligent nursing and frequent Osteopathic treatment, but not enough to in any way worry the patient. Guard against relapses from over eating.

LECTURE V.

Malaria, called also *Marsh Miasm*, *Intermittent Fever*, *Fever and Ague*, is an endemic disease, dependent upon the presence, in the infected locality, of a specific poison generated by a protozoon germ, *Plasmodium Malariae*, or *Haematozoon of Leveran*.

The term Malaria is commonly used in a general sense, to denote a class of intermittent and remittent fevers known as the Malarial fevers or diseases. This class of fevers is characterized by enlargement of the

spleen and liver, paroxysmal periodicity, and the presence in the blood, either free or within the corpuscles, of various forms of the above mentioned parasite.

Actiology.—The cause of this disease is peculiar, and not well understood. Although described by early writers as the "Bacillus" Malariae, it is now generally admitted to belong not to the class of bacteria, but to the class of protozoa. It is generated in swampy places, as the name (marsh miasm) implies, though by no means there exclusively. It occurs chiefly in tropical climates, and in places where strong heat from the direct rays of the sun, moisture, and decaying vegetable matter are present. It is often met with in localities where the soil is rich in organic matter. When the natural drainage outlets of a locality become clogged, the ground becomes water-logged, and malaria is very apt to be developed. Malaria is also known in some dry, arid regions. Large tracts of arable land, left without cultivation, frequently become malarious. Digging up of the soil, e. g., for the purpose of putting in an extensive sewer system, has long been known as a cause of epidemics of the fever.

The fertile strips of soil at the bases of mountain ranges in tropical countries are seats of the miasm, e. g., base of the Himalayas, where the soil, rich, well watered, and covered with forests, is notably malarious. Certain rocks, disintegrating, exposed to sun and air in tropical countries, are said to be productive of the poison, e. g., granite rocks, which are highly absorbent of moisture. When you come to consider that the rocks are one of the best fertilizers known, then you have some idea how they may increase the value of the ground by fertilizing it.

Decaying vegetable matter in the bilge water of ships has been assigned as the cause of an outbreak of malaria.

Certain low lands along rivers are known to be especially infected. Our Chariton River, it is said, is infected more on one side than on the other. On the west side the people are very apt to be malarious, while those on the east side are not.

New places, just under cultivation, and places with a damp subsoil, though the upper crust is dry, are very frequently affected.

Characteristics.—Malaria is described by Green as being strictly endemic, i. e., limited to certain localities. The disease must be contracted, here though it may manifest itself elsewhere. This would seem most natural from the nature of the cause. However, *epidemics* of malaria are common occurrences, while *sporadic* cases are known. Raue says it is not known why epidemics and sporadic cases should occur, as they have been known to occur, in localities which have never manifested malarial infections, in individuals who had not left the locality.

The disease is not contagious; it cannot be carried by one person to another. One person may be infected from another, says Green, only by direct intravenous inoculation.

The miasm seems to travel with air currents, and in certain definite plains. It may be stopped by a hedge or a wall, unless a strong breeze carries it over. It may be found only upon one side of a river, the other side being entirely free from it. A forest belt is often a barrier. Under proper conditions it may travel long distances upon air currents, provided the strength of the breeze be not sufficient to dispel the germs. They may rise with currents of heated air to considerable altitudes which are otherwise healthful. They have been known thus to ascend along ravines up mountains from five hundred to three thousand feet in height. Thus it is sometimes unsafe to place a dwelling near the edge of a ravine.

The virulence of the miasm varies some with the temperature, localities which are unhealthful in summer and autumn, becoming safe in the winter season.

There is a theory that the system of the host may become inoculated through the bite of insects, e. g., mosquitoes. However this theory, though probable, is questioned.

The Germ: As stated above, the germ of this disease is not a bacterium, but a protozoon. It is always present in the blood in malaria, either free in the serum, or within the red corpuscles. Its action upon the blood is marked, it being extremely destructive of the red corpuscles. Quain states that Prof. Keltch has shown that in 24 hours, a man affected with malaria lost more than a million globules per cubic millimeter. Thus the patient becomes anemic, and this state of the blood causes murmurs about the heart, which may lead to a mistaken diagnosis. The germ is seen in different forms at different times. The form free within the liquor sanguinis is minute, globular, and possessed of amoeboid movements. This seems to be the primary form. Again, the germ is seen within the red blood corpuscles, amoeboid, pigmented. Again, a large, pigmented, intracorpuseular form is seen; then an intracorpuseular, rosette form, with the pigment aggregated at the center; or the flagellated form is seen free.

Some writers maintain that the above forms are different stages in the growth of the organism. It may, further, be crescentic in shape, or become flagellated, the flagellae lashing about in the liquor sanguinis.

It is stated that the severe types of malaria in tropical countries are particularly connected with the appearance of the crescent-shaped germ, and that in temperate climates the crescentic form is rarely present, the flagellated form being produced immediately from the intracorpuseular discs. Leveran first discovered the germ.

Pathology and Symptomatology: The diagnosis of Malaria (typical) never fails on account of the clock-work-like periodicity of the phases of

the disease. Hence the name paroxysmal. There are three stages; the chill, the fever, and the sweat.

The chilly stage lasts from a few moments to three hours. The patient's appearance is marked. The features shrink; there is a chill, which may be violent; there may be vertigo, and nausea. The chill may be limited to a slight chilly sensation along the spine. Ordinarily the whole surface is cold, the face is pale; the nose becomes pinched; the breathing is shallow and quick; the pulse is small and rapid; but the internal temperature rises rapidly from two to seven degrees. Various symptoms attend this stage, such as headache, backache, cough, thirst, colic, etc.

The second stage lasts a variable number of hours, from two or three to ten or twelve. It comes on gradually, the body recovering from the chill, the temperature continuing to rise until it reaches a height varying from 100 degrees to 108 or even 109.45 degrees F. Various symptoms attend this stage.

The third stage also lasts a variable number of hours. In it the fever gives away to a profuse perspiration, greatly relieving the patient, the temperature declining to normal or near normal. This stage ends the paroxysm.

The patient now may feel quite well, the paroxysm not returning until the next day, in which case the type is called "quotidian," or the paroxysm is absent until the second day, ("tertian" type), or finally, until the third day, constituting the "quartan" type. Owing to this peculiarity, the patient often feels quite well and wants to go to his usual occupation. After he is well there is a tendency to the return of the trouble on the fifth, seventh, ninth or fourteenth day. The stage between paroxysms is called the stage of *Apyrexia*. The fever is called *intermittent* on account of the intermission between paroxysms. If the stage follows in the order given, the fever is "*intermittens completa*"; if one stage is lacking, "*intermittens incompleta*"; if in reverse order, "*intermittens inversa*". The most usual forms are said to be the quotidian and the tertian. The paroxysms, instead of occurring at regular intervals, may come each time earlier (anticipating), or later (postponing).

The fever is said to be *remittent* when between the paroxysms the temperature is lessened, but the fever merely slackens, and exacerbation recurs immediately. The intermittent fever may vary in form, being gastric or bilious, and attended with gastric derangement; typhoid, simulating that fever; or of a grave form leading to a rapid collapse. The symptoms of the latter form are great weakness, derangement of most of the organs, icterus, bleeding of nose, stomach or kidneys, dysentery, etc.

When the patient has resided long in a malarial region, and has gotten the system full of the poison, a low state of vitality exists, with various

symptoms characteristic of the malaria, but in mild form. This is called "*Malarial Cachexia*."

"Dumb Ague" is the name given to a variety of malaria, sometimes acute but usually chronic, in which the sequence of chill, fever and sweat does not occur. The symptoms are irregular chilly sensations, flushes, pains in joints and muscles, bronchial troubles, headache and neuralgia, etc.

Enlargement of the spleen (ague cake) and liver, with soreness of both, is a usual feature of all these forms, as well as a constant feature of the regular form. These both, and the spinal cord, become pigmented, probably through destruction of the red corpuscles. The urine is often irritating during the paroxysm.

Treatment.—Now as to medical treatment, quinine is the stock remedy, and is said to destroy the germ.

The Osteopath wants to get rid of the fever and of the poison. He stimulates, as far as possible, all of the avenues of excretion, the bowels, kidneys, liver and the lungs, in the ways already indicated. It will not be necessary for me to indicate this to you; simple and general stimulation of the excretory system. I think you all know the points at which you work. The second dorsal to the seventh dorsal, and also the fascia at the second dorsal and fifth lumbar, in all stages generally treat this way. I also treat the liver in a way with which you are familiar, and the spleen. Work gently, as you must bear in mind that these two organs are very likely to be congested in any such case as this, and you must not run the risk of rupturing them. For chill, relieve the internal congestion, and thus relieve the chill by stimulating the heart and the superior cervical ganglion. Stimulate the lungs as well, by raising the ribs from the second to the seventh on both sides. Give also a thorough spinal treatment. If you stimulate the spine all the way along you thus restore the circulation. When you find the body chilly, warm the patient by hot applications to the spine, feet, and axilla. Also give hot drinks and hot foot baths. Hare says the action of the poison at this stage of the chill has congested and engorged the thoracic and abdominal organs. Work especially upon the splanchnics and solar plexus in front, and over the abdomen in front to get rid of the congestion about the abdominal viscera; and the stimulation about the lungs already described, would get rid of the congestion about the thoracic viscera.

As to the fever, you treat it as any other fever. Cold sponging and cold drinks have been advocated by Hare. Besides that, Osteopathically slow the heart's action by inhibiting. You raise the arm and hold back on the shoulder for a minute or a minute and a half, and this will slow the heart's action. Inhibit the superior cervical, the splanchnics, and the lower lumbar to equalize the circulation. In the stage of sweating you should let the patient alone, as the perspiration removes the poison, caus-

ing the patient to feel better. Give plenty of water to drink, and encourage the perspiration by wrapping up warmly. Give hot foot baths, also stimulate the superior ganglia and lungs to help this improvement. The constipation and diarrhoea you know how to treat, as before indicated. In the period of apyrexia, give a thorough general treatment for tonic effect.

I might say our success is good in malaria if the case is taken in time, but if the disease has been coming on for some time it is more difficult to cure. Some two or three months ago a young man came to my house on Sunday with his face flushed, and the malarial symptoms very perceptible. I treated him that day and the next. He remained at home several days, but he was out within a few days.

Where you have a malarial constitution it will probably take some time to work this poison out of the system. I have had cases where they would have chills once a week. You can stop the chills and relieve all the symptoms.

LECTURE VI.

The various forms of Rheumatism are among the cases that the Osteopath is called upon most frequently to treat. The fact that most of these cases have become long standing chronic cases makes the average case of rheumatism somewhat difficult to handle and slow to cure. Very serious cases of deformity resulting from the disease present themselves for treatment. Frequently parts are dislocated, e. g., hip, knee, lower jaw, etc., simply in the progress of the disease. I have had several such cases. One case was of a man in this town who had been affected with Rheumatism for some years, but one day he went up town, and while walking his hip became dislocated. It shows you the drawing power of contraction in disease. I have seen more than one case where the lower jaw had been dislocated from the same reason. Joints become enlarged by the growth of tissues; the synovial membranes are destroyed and chalky deposits are formed in the joints. One of the most frequent phenomena you will witness in connection with Rheumatism, is the enlargement of the joints, for the reason that these cases, in the majority of instances, become chronic and this chalky deposit is formed. Consequently it becomes one of the main points in the diagnosis of Rheumatism. Hence it is not strange that the Osteopath frequently finds himself confronted by cases, certain features of which are beyond his skill, while at best, they, as a whole, are slow and unsatisfactory. It is rare, however, that the Osteopath cannot afford immediate relief from pain in any

case of Rheumatism, and, almost without exception, cases coming under his care are greatly benefited in most particulars. He can reset the dislocated joints, relax the rigid muscles, absorb to some extent the articular deposits, and give new freedom to stiffened joints. In almost any case of acute Rheumatism, whether muscular or articular, his success is practically assured, while in chronic cases he may usually obtain good results. Hence the success of Osteopathy as a treatment for all forms of Rheumatism is marked. The fact that so many cases are of years' standing, coupled with the fact that the patient frequently cannot continue the treatment for a sufficient length of time to obtain the best results, makes the average of the cases coming under the treatment slow and difficult.

In the special forms of this disease, such as Lumbago, Torticollis, Pleurodynia, etc., the treatment is very successful.

There are several forms of Rheumatism, commonly met with: Acute Rheumatism, known also as Rheumatic fever and Acute Articular Rheumatism; Chronic Articular Rheumatism, and Muscular Rheumatism. These three forms of Rheumatism are separate forms. Chronic Articular Rheumatism does not necessarily follow the Acute or Rheumatic Fever, although the latter may develop into the former. Sometimes the person is attacked from the beginning with this so-called chronic form of Articular Rheumatism. They seem to be distinct from each other, though the articular forms, both acute and chronic, are due to similar causes, and the latter often results from repeated attacks of the former. The muscular form is often complicated with the other forms.

Raue makes the following general statement regarding this disease. 1st. "It attacks either the fibrous tissues, joints, aponeuroses, the sheaths of the tendons, the neurilemma, the periosteum, or the muscles and tendons. 2. It is a peculiar, painful affection, caused, no doubt, by inflammation and nutritive disturbances; and, 3. It comes on independently of other acute or chronic diseases, or traumatic causes, etc."

Rheumatic Fever, (Acute Articular Rheumatism), is an acute, febrile disease, a constitutional disturbance, characterized by fever, sweats, and inflammation of the joints and serous membrane of the body. The tendency it manifests of attacking any serous membrane makes it frequently a dangerous disease.

Actiology.—As to the causes of the disease, they are two fold; predisposing and exciting. Among the former are heredity, 27 per cent; previous attacks; occupation, such as hard out door labor under exposure to the weather; social position, poverty being a frequent cause; and residence in certain districts.

Among the exciting causes are infection, this being considered by some a disease caused by micrococci in the system; exposure to wet and

cold; strains and muscular sprains; chills from overheating; derangement of the stomach and liver from the eating of rich food; mental effects, such as despondency and depression; exhaustion from sickness, lactation, uterine disease, etc.

Some authorities hold that there is accumulation of lactic acid in the system, acting as a poison to the tissues. Others hold that chilling of the surface of the body causes derangement of the parts of the central nervous system and vaso-motor disturbances, or pain, or trophic changes. In regard to the chilling of the surface of the body and this affecting the central nervous system, you see here it is given plainly in the aetiology of such a condition as rheumatism.

We generally understand a cold to be a congestion, but it has been suggested that it may be due to a nervous disturbance from chill. If your feet are wet or exposed, the result may be a cold in the head. It is clear in numerous respects, and I think the hypothesis of nerve causes is a very reasonable one. Some regard a chill as affecting nutrition, causing the retention of the lactic or other acid, which in turn affects the nervous system, causing affection of the joints. There is a germ theory, a specific organism being suspected; and a malarial theory, that it is due to miasm, or poison generated outside of the body. The general difference between the bacterial infection and the infection of miasm is that the bacteria get a foot-hold and propagate the poisons in the system as in typhoid fever, while on the other hand in malaria, the miasm is generated outside of the body, and the poison formed is taken into the system by the person visiting the locality infected by the poison.

All this goes to show that the nature of the disease is not well understood, although a late writer says; "It is apparently becoming more and more recognized as a purely *infectious* disease." (Raue.)

Pathology:—Structural changes in the joints are sometimes very slight, following the inflammation of the synovial membrane; merely a slight exudation containing a few pus cells and but little fibrin is noted. There is *oedema* in the cellular tissue about the affected joint, causing a visible swelling. One of the most frequent symptoms that you will note in cases of rheumatism, whether of long standing or recent, is that the joints will swell. I am treating a case now in which the two fingers on the left hand will swell. Sometimes it will be in the hand, and sometimes about the various joints.

In severe inflammation of the synovial membrane, considerable pus and fibrin are present in the exudation, and the ends of the bones may become infiltrated. The heart and large blood vessels contain a large amount of fibrin; the cartilages of the joints probably suffer inflammatory changes. When there has been much fever, there is apt to be granular degeneration of the liver and other solid viscera. The inflammation

frequently attacks the heart, or lungs, or pleura. It may attack the peritoneum, larynx, testes, or renal tubules of the kidneys. There may be congestion of the lungs, pericarditis, myocarditis, or endocarditis. It is this tendency of Rheumatic fever to attack the heart especially, and the lungs, that renders it so often fatal. It is said that about twenty per cent of all cases are complicated with endocarditis, fourteen per cent with pericarditis, while myocarditis is quite rare. Pleuritis, pneumonia and meningitis are still less frequent.

Symptoms:—Three prominent and constant symptoms of Rheumatic fever are, fever, sweats and arthritis. The fever is variable, frequently, but often follows a tolerably regular course. It is present at the outset, and lasts as long as the disease preserves its acute character. Usually the temperature does not exceed the normal more than one or two degrees. It is usually moderate if the joint symptoms are so, but may rise to 104 or 104.00 degrees F. under an opposite condition of affairs. Sometimes the fever rises rapidly and becomes very high without respect to other symptoms. The fever is remittent in type, rising from one-fourth to one degree in the evening. The sweats are acid, and the skin is often covered by a fine red or white rash. The perspiration is profuse, and of an acid odor. It varies in amount and is most profuse when the pain is greatest. It is said that the odor is so strong and so characteristic that frequently the diagnosis can be made from that alone. The sweats are not weakening, but though unpleasant to the patient, afford him great relief.

The arthritis, or inflammation of the joints, is marked by **swelling**, redness, pain and heat. Pain in a joint marks the onset of the attack, it swells and reddens and the effect may spread from one joint to another, or remain localized at one joint. The joints of the spine and the symphysis pubes may be attacked, but the toes are rarely invaded. I had a case in which every joint of the body was attacked. The person was practically immovable. Every articulation of the spine, everything but the lower jaw was attacked by the arthritis. The kidneys were very bad, the arms were drawn at the elbows, and the knees were drawn up to a right angle. There was great pain, perspiration, and on the whole it was very distressing. The lower jaw usually escapes, although I have seen several cases in which the lower jaw was attacked.

The pain is excruciating: much increased upon movement. It begins as a sore feeling and may become throbbing. It very gradually disappears, leaving a bruised feeling in the joint. The color of the swollen joint is red or pink, and feels warmer than the surrounding part.

The joints most affected are the knees, ankles, shoulders, wrists, and elbows, i. e., the larger joints.

Besides the fever, sweats and arthritis, there are various symptoms.

You will notice here a similarity between Rheumatic fever and other specific fevers. An attack comes on much in the manner of any acute specific fever. There is chilliness, malaise and general debility; sore throat, aching of limbs and trunk, flying pains in the joints are noted. The patient lies stretched upon his back, carefully arranged that every joint may be guarded; the complexion is sallow, and the cheeks flushed. Thirst, lack of appetite, frequent, weak pulse and slightly accelerated respiration are all present. The reaction of the urine is acid, it is scanty and high colored.

The joint symptoms are transient, usually, passing quickly from one joint to another, those sore one day being nearly well the next, while still others have been invaded. The tongue is coated with a moist white fur. The tongue is sometimes coated brown, or is dry and cracked. Dyspepsia and bowel disturbances occur. There may be diarrhoea or constipation.

The urine is scanty, high colored, strongly acid and contains a quantity of urates and uric acid, which are deposited as a thick sediment upon cooling. Delirium and stupor may arise, but are rare. Sleep is either prevented or much broken by the severe pain. The patient's mind is much disturbed over his condition, particularly if he has had previous attacks. I have a case of a little girl in which the disease began with a sore throat. Both arms and both limbs are affected, and the right hip has been drawn out by the disease. She has been affected this way for five or six years. In all respects the bodily health is excellent. The kidneys are in a healthy condition. The urine is frequently analyzed, and only in case of cold does the urine show a departure from the normal. She is fat and has splendid general health. This shows what severe cases of specific disease may exist in which the general health will be good. This is something that I have wondered at, and something which I think you will notice.

Course, Duration and Terminations:—Children and old people are rarely attacked; the majority of cases occurring between the ages of fifteen and forty. Men are more liable to it than women, probably because they are more exposed to conditions of the climate. Robust persons are more frequently victims than are debilitated ones. The disease is more common in the spring and winter seasons, and is observed in all climates, though most frequently in temperate ones.

The course does not follow a regular cycle, but is variable. The attacks may pass off in ten or twelve days, or may worry the sufferer for many weeks, finally passing into a more or less chronic form.

Convalescence is as a rule tedious, may be accompanied by desquamation of the hands and feet, or of the body generally, and is frequently followed, if not by more severe sequelae, by pain and weakness in the joints. The remote effects of the disease frequently persist during the

rest of the life, and are sometimes considered of more consequence than the original attack. Such are chronic arthritis; heart disease, especially valvular; disease of the lungs, brain, kidneys, or vascular system.

Complications:—Various complications arise in the course of the acute attack; rendering it more serious and more difficult to deal with. Organic heart disease is most common, fifty per cent being the estimate. It is said that children and youths seldom escape it. Its presence is more common in severe attacks, women seeming to be more subject to it than men. If the case is neglected, heart symptoms are more likely to appear.

Complications of diseases of the lungs are likely to occur and are responsible for death in a large proportion of the fatal cases. Such are pneumonia, pleuro-pneumonia, pleurisy, bronchitis, and pulmonary bronchitis. Other complications are renal, serous inflammation, gout and scarlatina.

Diagnosis:—The diagnosis is usually made without difficulty, but is often rendered a matter of great difficulty by the tendency manifest, in the period of invasion, to resemble in symptoms the acute specific fevers. The diagnosis rests upon the family history, the history of the attack, the pain and tenderness of the joints, the moving about of the joint symptoms from joint to joint, and the acid sweats.

Prognosis:—As regards death is good, only about four per cent. of the cases being lost. But as regards succeeding health, it is described as most uncertain, owing to the variety of complications, and the uncertain course of the disease. Under Osteopathic practice the prognosis is good for Acute Articular Rheumatism. It runs a mild course in children and old persons. One must be guarded in prognosis in cases of patients who have cardiac or lung symptoms.

LECTURE VII.

I wish to call your attention to a couple of points in regard to Acute Rheumatism, or Rheumatic Fever. That is, the higher the fever, and the more the pain shifts about from joint to joint, the more liable the fever is to go to the heart. There is greater danger then of it attacking the heart. The other one is that as long as the alkalinity of the urine is retained, the heart is not so liable to be attacked.

Chronic Articular Rheumatism is a painful inflammation of one or more joints, running a chronic course. Two forms are described by Raue; one in which some single joint remains chronically stiff and painful; the bones crepitate at the joint upon motion being made by the

operator; the joint may be swollen, or the swelling may be lacking, or only apparent, through the atrophy of the surrounding muscles.

The second form is merely repeated attacks of rheumatism. The patient is very sensitive to changes in the weather, and can often foretell them by pains in his affected joints. This form is often complicated by rheumatic neuralgia or paralysis.

Aetiology:—The causes are mainly the same as for the acute form; heredity, exposure, mental depression, poverty and physical exhaustion. The disease attacks mostly persons in middle life or in advanced age.

Pathology:—The ligaments and synovial membranes are thickened, enlarging the joint; the bones have become spongiiform at the cartilaginous ends, and the synovial fluid is turbid. Very commonly the joints are enlarged and deformed. There is hyperæmia and effusion in the tissues about the joint.

While the disease in many cases is the result of the acute form, it may attack one independently of previous illness. Quain states that in some instances, one member of a family is affected by the chronic form, while brothers and sisters suffer from acute rheumatism.

Symptoms:—The most marked symptom is pain and stiffness of certain joints, aggravated by bad weather, and becoming most severe at night. The affected joints are dry and stiff, and crepitate upon movement. Rubbing and exposure of the joint to cold atmosphere lessen the pain, but increase of warmth aggravates it.

This form of Rheumatism varies much with individuals, some are affected with stiffness and pain in some single joint. The joint does not seem to have undergone structural change, and the patient may have good general health, leading an active and vigorous life. Other cases present more severe symptoms. The pain in the joint is greater, anatomical changes have taken place in it, and it is red, painful and swollen. There are repeated attacks of sub-acute rheumatism.

Still other cases present more marked symptoms of pain, swelling, etc. The changes in the joint are marked, the attacks are so frequent that the patient is in almost constant pain. The joints are often ankylosed or dislocated. This disease often leads to permanent disability, but deaths from the disease directly are rare.

Heart disease, as in the acute form, is a frequent complication. Dyspepsia, and the formation of renal calculi often occur.

The Prognosis under Osteopathic treatment is good. In all cases relief can be given, and in a certain number entire relief from the symptoms is obtained. Medical prognosis for cure is very unfavorable.

MUSCULAR RHEUMATISM:—This form of Rheumatism differs considerably from the other forms described, on account of the different regions of the body in which it settles, attacking muscles, tendons, peri-

osteum, neurilemma, fascia, and other fibrous structures, but never joints. It shows a tendency to attack certain groups of muscles, causing varieties of Rheumatism, to which specific names have been given, e. g., Lumbago, Pleurodynia, Cephalodynia, etc. It is frequently associated with other forms. This disease is characterized by pain and spasm in the part affected, and by some fever.

Actiology:—A rheumatic diathesis is said to be the chief predisposing cause. It attacks one at any age, and of either sex. Exposure to cold, particularly to a draft upon a muscular part; strain of the muscles or ligaments, are the chief causes of an attack.

Raue describes the pain of an attack of muscular rheumatism as, "tearing, shooting, stitching, screwing, burning; sometimes aggravated and sometimes relieved by motion, rest, cold or warm application, etc." Little is known as to the pathology of the disease. Sometimes fibrous growths are formed in the muscles, and the peripheral nerves are grown together, but usually there is no change discoverable in the muscular structures. Swelling and redness may be present or lacking.

Symptoms are slight fever, sore throat, pain in the muscles, which becomes severe and spasmodic. The patient assumes characteristic attitudes to give ease to the parts. The tongue is furred, appetite is poor, constipation is present, also general malaise. Most of these symptoms may be wanting in any given case.

This Rheumatism is not of long duration in many cases. It may disappear in a few days or weeks, or may remain as a chronic ailment, affecting the muscles of a particular part. It readily yields to Osteopathic treatment.

The chief varieties are *Rheumatic Torticollis* (stiff neck); affects the muscles, or the sterno-mastoid, drawing the head to one side, (wry neck).

Lumbago, affecting chiefly elderly persons, coming on suddenly; the patient, stooping over, finds himself unable to rise. It affects the lumbo-dorsal fascia, the erectors spinæ, and smaller lumbar muscles. I remember one case of this disease in particular. I was called early one morning to go to see a lady who had been sitting upon a chair and bending over her trunk, and when she went to arise she could not get up. When I got there I first relaxed the muscles all along the lumbar region as best I could with her sitting upon the chair. She was put in bed and I soon got the muscles all loosened. She was soon all right again, was about that day. I did not hear of her being troubled afterward, although I lived in that neighborhood for some time.

Cephalodynia, attacking the frontal, occipital, temporal muscle, the galea capitis, or periosteum of the skull.

Dorsodynia, of the muscles of the upper part of the back and shoulders.

Pleurodynia, of the fibro-muscular structures of the chest, causing pain in the side, cough, restrained respiratory movements; in pectoral and intercostal muscles.

*TREATMENT:—Osteopathic treatment of Rheumatism must be persistent but not severe. There is danger in Acute Rheumatism of setting up fresh inflammation and driving the disease to the heart, if too severe treatments are given. Hence use *great care*. One should not treat too often or too long, especially at the beginning of treatment. Three times per week is sufficiently often. Length of treatment should vary from ten to fifteen minutes, according to the case.

Too frequent and prolonged treatments, as well as too severe handling are especially apt to irritate and do harm in Rheumatism, because of the soreness and pain that naturally accompany the complaint.

In any case of Rheumatism, the Osteopath must give especial attention to stimulation of the *kidneys*. He must also thoroughly treat the *liver* and *bowels*, stimulate lung action and cutaneous circulation, all with a view of removing the acid from the system. The liver is said to be frequently enlarged in Rheumatism.

Dr. Harry Still always has good success in treating rheumatism, and his treatment upon the kidneys is invariably this already described to you as stimulation of the kidneys, from the sixth dorsal to the second lumbar. Your work upon the liver and bowels is for the purpose of eradicating the poison from the system. You must also stimulate the twelfth dorsal and upper lumbar. You know how to stimulate the lungs from the second to the seventh dorsal on each side, also stimulate the second dorsal and fifth lumbar, centers for the superficial fascia. A general spinal treatment is given, and bathing and as much active exercise as the patient can take are good.

The treatment then for the liver, over the ribs from the eighth to the twelfth; kidneys, sixth dorsal to the second lumbar, also the twelfth dorsal and the upper lumbar; for the lungs, second to the seventh dorsal on each side; for the fascia, second dorsal and fifth lumbar; add to that, treatment to the superior cervical ganglion of the sympathetic, reaching the center for the medulla.

I have seen Dr. Harry Still take a case of Rheumatism and for the first work do nothing but stimulate the bowels, kidneys and liver, and he would not go any further. I have often wondered why he should give such short treatments, but he is very successful in treating Rheumatism. The treatments are new to the patient, and this is all that he

can stand. You must gradually extend your treatment to other parts of the body, since in the various forms of Rheumatism, the digestive and circulatory systems may be deranged, the heart and lungs, kidneys, and blood all undergo pathological alterations, and even the brain may be affected. The Osteopath must keep close watch upon the condition, and by combining thorough general and spinal treatment with the specific measures he employs, keep the system and its special parts and organs well stimulated and sustained. He may thus prevent or repair these pathological changes, aborting the attack, or giving grateful relief.

In the articular forms, the object of treatment is to spread the joint and give free access of blood and nerve flow. There are particular ways. It is well to work the arm up and around. But it does not reach as well as a particular move, taking the arm of the patient in one hand I double the other hand and place it in the axilla. I then push the arm of the patient down close to the side: that springs the shoulder joint, allowing the articular nerves and vessels free action. If it be in the spine, this movement of traction that I have shown frequently is good, or with the patient sitting with the hips held down, while you reach down and lift at various points along the spine, thus spreading. For the knee and ankle, you can have someone hold under the shoulder while you pull, spreading the joints of the knee and ankle. Another way that I have for treating the knee is to place the foot of the patient between my knees and to work in the popliteal space, holding the knee and spreading the hamstring muscles. Another very good way is to have the patient sitting upon a chair, place your knee under that of the patient so that his popliteal space rests upon your knee, and spread the joint by pushing the leg downward. As to the wrist and fingers, you can by holding the forearm in one hand, spread the wrist joint and the fingers by traction. At the elbow I have the forearm semi-flexed upon the arm, that releases the olecranon process and I can spread the joint by traction at the bent elbow. This motion will apply, I think, to all of the joints of the body, so that you will have no difficulty.

When there is motion in the joint and the synovial membrane is not destroyed, the chances of restoring it are good. You cannot tell how much of the joint has been destroyed. You can only tell by general symptoms, by the amount of motion and the amount of pain, judging from these that the synovial membrane has not been destroyed. Then you have a great deal better success than if the membrane has been destroyed. Spreading, as I have said, renews blood and nerve supply and absorbs deposits, but it will take many months. You must have the patients treating for month after month. A great many people do not have the patience, even if they possess the means, to continue the treatment long enough to get the results. If people possessed the patience

to continue the treatment a sufficient length of time, we could do so much more good than we can under other conditions.

In Acute Rheumatism great care must be taken in spreading, on account of the pain. The same is true to a considerable extent in the chronic forms. You must gradually accustom the patient to the treatment so that he can stand a great deal more.

In Muscular Rheumatism, the treatment must be directed to stretching and thoroughly kneading the affected muscle, tendon or joint. I lay special stress upon stretching the muscles. If you have, say the biceps muscles of the arm affected, I would adopt some such motion as this: push the arm out straight and back, the idea being to increase the distance between the bony attachments, so as to stretch the muscles. Get the best way to stretch and elongate the muscle itself. Owing to the elasticity of the muscles they may be stretched, allowing free flow of blood through them. You can also knead some, and you can prescribe baths. A salt rub is good. Massage treatment will not be a bad thing with the idea of loosening the blood flow, taking away the congested condition; but we do not depend much upon this massage, the principal treatment being to knead the muscles and to stretch them. I believe there is a theory that the specific poison is retained in the diseased part, so that by throwing more blood to the part and by stimulating that region it helps to carry away and throw off the poison.

The Osteopath must always trace the nerve supply of the affected parts and look for lesion to the nerve or centers. In sciatic rheumatism and in rheumatism of the arms, I have found distinct lesions along the spine. Within the last month I have had four different cases in which there was rheumatism in one or both arms, and in each one of these cases I have found some slip of the vertebræ in the upper dorsal region, this being the region that seemed to be most involved, while in sciatica and in lumbago you will often find slips or lesions along the spine. It is a part of our system, this finding of special lesions. When you find such lesions, although you may not be able to directly connect them with the disease, you must be able to trace indirectly in this way.

In lumbago there is a direct lesion to the nerves of the lower spinal muscles. I have found that the best way to treat this is with the patient sitting upon a chair. This is the same treatment that I have shown for other things, that is for stretching the joints of the spine. I work here particularly along the lumbar region, lifting and turning as I go, with the idea of loosening these muscles and correcting any slip which may have occurred.

Besides the points already mentioned, heat and rest are valuable adjuncts to the Osteopathic treatment.

Acute:—In the fevered stage of Rheumatism, the cold baths, cold pack, and sponging with tepid water are beneficial.

The patient should be placed in bed between blankets, which absorb perspiration and prevent the chill of damp linen. Rest for the affected joint is supplied by wrapping it in cotton, wool or other soft, warm material. Warm fomentations give relief when applied to the joint. As far as possible we move the joint, especially in the chronic forms. The joint is placed at rest entirely in this acute form, but if it is kept there too long it may become ankylosed. If you keep up motion to the greatest extent possible you will be able to get better results. I have not known of a case which was followed out by Osteopathic treatment where the joint was left stiff. It is a matter of judgment as to how far to work the joint.

In chronic forms warm clothing and housing, protection from climate, relief from toil and muscular exertion, Turkish baths, warm or hot fomentations applied to the joints, followed by vigorous rubbing, are valuable aids to Osteopathic treatment.

In muscular rheumatism the same general plan of treatment may be followed.

It should be borne in mind that these various adjuncts may not be necessary except in severe and stubborn cases. If the simple Osteopathic treatment is sufficient you will not need to be bothered with these other things.

LECTURE VIII.

Influenza, Catarrh and Colds:—These three maladies are somewhat similar in pathology. They frequently are presented to the Osteopath for treatment, and such treatment is, as a rule, in the highest degree successful.

The treatment for influenza, and for the condition commonly known as cold, are almost identical, while that for catarrh is, as far as it goes, similar. Hence, these subjects may be conveniently considered in the same lecture. The fact that all may depend upon the same agency for their production, at least to some extent, namely exposure, and the fact that in all the main pathological facts are the congestion of the blood in certain parts of the body, the tightening of the muscles and ligaments, and the aberration of nerve function consequent to these conditions, makes them especially interesting to the Osteopath, and especially amenable to his treatment.

Influenza, commonly known as La Grippe, called also Catarrhal Fever and Epidemic Catarrh, is described as an acute, infectious, epidemic dis-

ease, marked by febrile symptoms, and usually complicated with other serious affections, being followed by sequelæ that are frequently distressing and severe in a marked degree, such as progressive muscular atrophy, various forms of paralysis and spinal trouble, etc. There is one patient here at present suffering from Locomotor Ataxia and progressive muscular atrophy. He tells me that he had four or five different attacks of influenza. I think that his disease may have developed from these repeated attacks of influenza with the attending nervous symptoms. It is not at all surprising that such serious results should follow, when you come to consider that these nervous disturbances reach far enough to alter the state of nerve centers to a very marked degree.

As a rule this distressing malady occurs epidemically on a grand scale, though it may also occur endemically, and occasionally sporadically. Usually vast areas, such as whole countries, are successively invaded by the epidemic. Epidemics are recorded as early as 1729.

Its manifestations are varied, different epidemics seeming to possess different marked characteristics, but three different general forms have been described:

(1) Simple, without serious complications. (Catarrhal.) This form attacks particularly the membranes of the respiratory tract.

(2) Thoracic, involving the thoracic viscera, and complicated with such affections as pneumonia, bronchitis, etc.

(3) Abdominal, or Gastro-Intestinal, affecting the digestive organs. I will mention one fact here, lest I forget it when speaking of colds. I have known people to have a severe attack of intestinal cramping, accompanied with constipation or diarrhoea and severe colic—symptoms arising from what I believe to be taking cold in the abdomen. They in some way get the abdomen exposed, perhaps by a change of clothing, which would cause the cold to settle in the abdomen without necessarily being felt elsewhere. This, I think, will be a valuable suggestion to you.

(4) To these has been fittingly added the Neural or Cerebral type, attacking the nervous system, often simulating the clinical course of Typhoid fever, as does sometimes the Intestinal type.

It is stated that these various types may all be seen in the same family in which several members may be suffering.

Clinical Features:—The onset is, as a rule, very sudden. The patient may note the first symptoms upon rising from bed in the morning, upon rising after sitting, or when about his daily tasks, having a few moments previously felt entirely well. It usually manifests itself first by a chill, followed by a fever, loss of appetite, headache, lassitude, aching and soreness of the back, limbs, and muscles, profound mental and physical depression, catarrhal inflammation of the nasal mucous membrane, etc. This malady may affect persons of any age, sex, or occupation. Pulse slow;

constipation; temperature irregular to high; urine scanty and high colored, or profuse and light colored.

Catarrhal Type.—Dryness of the nostrils, sore throat, sneezing, watering of the eyes, difficulty of swallowing and of breathing, and pains in the eyeballs are present. These symptoms may remit during the day, increasing at night. The tongue is moist and coated with a creamy fur, the pulse is frequent (80-100). Diarrhœa is often a symptom, as well as inflammation of the ear.

Thoracic Type.—In this form, in addition to the usual symptoms, are seen pneumonia, bronchitis, pleuritis, quinzy, and infiltration of the lung. All the prominent symptoms are concerned with the thoracic viscera. A peculiarity of the Bronchitis is the general inflated condition of the lung, which, instead of collapsing upon opening the thoracic cavity, protrudes from the aperture.

Gastro-Intestinal Type.—Soreness of the abdomen, biliousness, nausea, vomiting, sometimes jaundice, diarrhœa, etc., are prominent symptoms, in addition to the general symptoms named above.

Cerebral Type.—The nervous symptoms predominate. Headache, delirium, tinnitus aurium, muscular twitching and hyperæsthesia are all noted.

Influenza is of variable duration in length of time of the attack. It may disappear in forty-eight hours, or it may remain acute for several weeks. Often it subsides into a semi-chronic state, and keeps the sufferer miserable for months. It seems to attack the weak points in the system, and to develop latent morbid processes already present. It is not usually of itself fatal, but causes death in a fair average of cases through some complication or sequel. The Bronchitis of Influenza seems to be the most fatal.

A serious feature of this disease is the sequelæ it leaves. The mental and physical depression often persist after the acute attack. Hypochondria, tuberculosis and paralysis frequently supervene. The poison left in the system has, according to Gowers, a peculiar liability to affect the nervous system. Hence the nervous sequelæ, both from their nature and frequency, are the most marked of the after effects. Mental dullness, melancholia, and delirium, the general paralysis of the insane; hysteria, cataleptoid and epileptic seizures; neuritis and affections of nerve centers, are all among nervous sequelæ of Influenza noted by Gowers.

Ætiology.—Little is known definitely concerning the cause of this disease. Some writers have suggested an atmospheric influence, as well as the effect of bad drainage and poor sanitation, as being the cause. It seems probable that the true ætiological factor is a microbe discovered by Pfeiffer, Kitasato and Canon in 1892.

CATARRH:—Catarrh, Coryza, or cold in the head, is an inflammation of the nasal mucous membranes, with increased secretions from them.

The term Catarrh is used in a general sense in describing the inflammation of any mucous membrane in the body. Thus there is Catarrh of the stomach, Intestinal Catarrh, Catarrh of the bladder, etc. The term Coryza is usually employed to designate Catarrh of the nasal membranes.

Symptoms and Actiology:—Catarrh is brought on by exposure, by too sudden cooling of the body when heated, or by sudden lowering of the temperature. It occurs sporadically, sometimes epidemically, and one attack predisposes to another. It is sometimes caused by inhalation of irritating gases, such as chlorine, etc. It is stated by Raue that epidemics seem to depend upon a peculiar unknown condition of the atmosphere, probably deficiency or superabundance of ozone. You will also find frequently that the contraction of muscles has drawn the vertebræ out of place. This, frequently, has been found to be the case by our practitioners, and there does not seem to be any reason for doubting that the vertebræ may be drawn out of place by contraction of the muscles. I have had cases of trouble in the neck where the vertebræ were displaced. It is often the second or third. I have often found when I had replaced a vertebra that the effect of a cold was to draw it out. I will say that such may not be the case except where there has been a previous accident, causing a displacement of the vertebra, but I am convinced from my observation that a vertebra may be drawn out by overdue contraction of a muscle. And from the standpoint of Osteopathy this disease may be caused by some faulty condition in the anatomy of the neck, contractions of the deep muscles, or displacement of cervical vertebræ, usually of the second or third, which interferes with blood and nerve supply of the nasal mucous membrane by shutting down upon the jugular veins, thus preventing venous return, or by affecting nerves controlling the blood flow, thus disarranging it. These conditions either weaken the membranes and leave them susceptible to the influence of the ordinary aetiological factors, or they cause a congested and inflamed condition of these parts, attended with the increased secretions characteristic of catarrh.

The Symptoms are chilliness, headache, indisposition, sneezing, dryness of the nose and throat, etc.

The inflammation extends into the frontal sinuses, into the antra of Highmore, through the nasal duct to the lachrymal sac, causing conjunctivitis, or into the Eustachian tubes, affecting the ears. The inflammation may also extend from the mucous membrane into the skin of the nose, or down into the bronchi, causing lung troubles.

The catarrh is described as serous, mucous, or muco-purulent according to the nature of the secretion. The first secretion is thin and watery,

the second is thick, a copious discharge of mucous; the third is composed largely of leucocytes, and partakes of the nature of pus.

This latter discharge may, in chronic cases, decompose in the nasal cavities or in the sinuses and become extremely offensive.

COLDS:—A cold, regarded by some writers as a nervous disturbance, is usually considered as a congestion of the blood in the vessels in some part or parts of the body, brought on by exposure in some form. Coryza is a cold in the head.

Actiology:—Cooled surface of the body and closed pores drives the blood inward, increases the work of the lungs, and causes it to congest at weak spots: exposure to the cold or damp, e. g., getting the feet wet, sudden cooling of the body when heated, sitting or standing in a draft, living in overheated quarters, sleeping under too heavy covers, and wearing of too warm clothing, thus causing the body to become tender, are among the usual causes of catching cold. I have known people who were foolish enough to suppose that by keeping in doors all the winter they would be free from colds, and it is almost invariably the case that they will have a cold much of the time. They stay in warm rooms and sleep under too warm covering, and the body becomes tender. Coming suddenly from very cold temperature into very warm, as from out doors into a super-heated room, will give a person a cold as quickly as to go from a heated room out into the cold. The system is not always able to accommodate itself to such sudden changes of temperature.

Symptoms are similar to those noted in Catarrh, namely: chilly sensations, discharge from the nasal mucous membranes, headache, light hemorrhage from the nose, soreness and stiffness of the muscles, etc.

One attack predisposes to another. The patient frequently falls into a semi-chronic condition, continually taking more cold and seldom being without one. This is likely to happen on account of the deranged circulation, the patient frequently breaking out into a perspiration with slight exertion, this being followed by further chilling and fresh symptoms of a cold. A cold, if severe, may have severe complications; pneumonia, bronchitis, influenza, etc.

Treatment, (heat):—The drinking of hot lemonade, hot foot baths, especially upon retiring, or wrapping up well in a dry blanket to produce copious perspiration are usually enough to reduce a cold at first. It is said that if a cold is treated this way vigorously within the first twenty-four hours you can reduce it. These things should be used at night, and additional clothing should be put on next day, as the system is weakened from perspiration, and care should be taken not to take more cold. Some would prescribe dry heat instead of moist. Heating of the feet before a fire is a good thing, and does not open the pores in the way that hot water does, so if it is in day time when you cannot

take the care you would like, this application of dry heat is perhaps a good remedy at first.

Influenza:—I give the patient a thorough spinal treatment. I had a case of cold to treat this morning, and I gave the same treatment that I give for influenza. With the patient upon the face, thoroughly loosen all the muscles and thoroughly stimulate the whole spine. The theory you already know. If I could not work enough with the patient upon his face I would turn him over and thoroughly stimulate the lungs, kidneys, liver and fascia in such a way as to work off the effects of the disease. That, in cold or influenza, is the particular Osteopathic treatment. For the lungs, the second to the seventh dorsal vertebra; kidneys, lower splanchnics; liver, at the abdomen, from the eighth to the twelfth ribs on the right side, raising the ribs, working in the right and left iliac fossae to reach the hypogastric plexuses, and deep over the solar plexus. Guard against the possible settling of a cold or influenza at these points, also attend to the fascia at the second dorsal and fifth lumbar. That is, include these points in your spinal treatment.

Should the influenza have settled in the abdomen, give a thorough abdominal treatment, embodying the points already given. I would also give an *anema* in such a case to relieve the bowels of fresh congestion. I would treat the spine especially from the middle dorsal down, and all these plexuses of nerves through the abdomen.

For Cerebral Influenza I would look particularly for any condition of contraction of the muscles along the spine. I first look for any contractions of the muscles in the neck. It seems to me from my experience there is always a contraction of the muscles of the neck although the cold may be elsewhere. It may be settled in the chest or some other part of the body, but there will almost always be a contraction of the muscles of the neck. I do not know that I ever found a cold where there was not this marked condition of contraction of the muscles. See whether or not there be any displacement of the vertebræ; the contraction of the muscles is very apt to bring on such a condition. In my experience in order to find out whether or not there is displacement of a vertebra, I stand behind the head and turn it from side to side, getting in deep to find if there be any displaced vertebra. In several cases where I knew there was trouble in the neck, I could not tell by standing at the side where the vertebra was out. When you are working on a patient in bed, bear this in mind, to get the patient in such a position that you can go to the top of the head. When there are these cerebral symptoms, and the trouble is especially in the head, you must treat the spine, equalizing the circulation, and sending the blood elsewhere.

In Catarrh, as well as in cold, we would first thoroughly loosen the muscles about the neck, especially about the sides and back of the neck,

also the styloid and hyoid muscles. Take the muscles which are attached to the styloid process and thoroughly relax them. A good treatment for catarrh is to hold under the lower jaw and have the patient spring the mouth wide open, you rub the muscles well on each side and thoroughly relax them. Stand at the side and press in deeply at the styloid process with the idea of loosening these muscles and freeing the flow of blood through the carotid artery. Dr. Harry Still uses this treatment in almost every case, (and sometimes almost exclusively) of catarrh and troubles with the eyes and ears. He will have the patient open his mouth five or six times. Now particularly in catarrh you will find the second and third vertebræ are apt to be deviated to one side or the other. We treat here at the upper part of the neck, and reach the superior cervical ganglion, thus influencing, through the sympathetic plexus, the different parts of the brain, and through these nerves, the sub-and great occipitals, thus reaching the medulla, which you know contains the vaso-motor center, thus influence the general circulation of the body. It is important to work down along the spine to get the stimulating effect and the distribution of the blood flow. Also treat all these points of the fifth nerve, at the supra-orbital, the infra orbital and the mental foramina. Have the patient open the mouth wide, push the finger into the glenoid fossa, and have the patient close his mouth, that will have the effect of loosening the ligaments, and, it is claimed, affects the fifth nerve. We also reach the fifth nerve through its connections sympathetically by working upon the sub-and great occipital nerves. I also in addition to this always thrust my finger behind the clavicles, thus raising the clavicles and stimulating the flow of blood. Another treatment is to have the patient lie upon his back, and with the mouth open, I place the finger against the hard palate and work from side to side, back along the soft palate, uvula and pillars of the fauces..

I am treating a case at present in which the tonsils are chronically enlarged and the uvula is over one half an inch in length. These internal treatments reach that condition much better than any treatments I have been able to give. In this connection, you will often have a patient with a little hacking cough, most frequent in children; if you will look into the throat you will find that the condition of the soft palate is causing just enough irritation to keep up this little cough. By this internal treatment, and by treatment in the neck you will be able to stop the cough. I have another case which is rather peculiar, in which the mucous membrane of the throat is congested. There is an irritation of the throat which is dry and scales off in great dry flakes, sometimes blood mixed in it. It is peculiar in being so dry. I have treated the case in the way indicated to you, especially the styloid and hyoid muscles, quite hard. It will not hurt usually to work hard, but that you can

determine by the condition of your patient. I thoroughly relaxed in this way, and the lady who before had to have water by her bed at night and frequently during the day, is very much better. Also in a cold we treat the sides of the nose, working from the lachrymal duct down. It seems to stimulate the nerves and the flow of blood, freeing the membrane very well. We can free very nicely by working down the nose in this way. This is on the same principle that our mothers used to grease our noses with goose grease. For a stoppage of the nostrils and difficulty in breathing, here is a motion that we employ with very good success. It is best to have a pillow. Lay the palm of the hand flat on the patient's forehead, press down hard at the frontal region, and bring a great deal of pressure in this way. The nerve connection is probably through fibres of the fifth. A great many cases of nostril stoppage will be relieved in this way. Work all about the eyes and loosen all about the face to relieve the congested condition.

Now I might explain to you my particular method of *treating a cold*. I have the patient lie upon the back, and I raise all the ribs and stimulate the lungs very briskly, on either side from the second to the seventh dorsal. I work from the middle dorsal above as low as the twelfth dorsal, successively, having my hands against the angles of the ribs, and raising them as I go very briskly and very energetically. This is a great stimulation of the lungs as well as of the circulation throughout the body. I then bend the arm; this will stretch the muscles over the chest and raise the upper ribs, then I raise these upper ribs by pushing the arm up and working under the clavicle.

I frequently have been able, by this treatment, to relieve heavy colds in one treatment. If you can always do that you will be very fortunate. I give a brisk and thorough treatment to the neck as well, and sometimes it is the best thing you can do for the patient to thoroughly loosen the neck.

If in any of these troubles there is a development of any special symptoms, you must attend to these symptoms at once.

Q. Do you think it is necessary to remove the tonsils?

A. It is often done. I do not think it is necessary if we get the case in time. As to whether it is ever necessary, I presume it is. Sometimes they grow again and sometimes they do not.

Q. Do you give the same treatment for dry catarrh that you do for moist catarrh?

A. Yes, sir.

Q. What would you do in case of croup. Could you give immediate relief?

A. I should treat the neck thoroughly. I have been able by treatment to give immediate relief. I would work all about the throat

and neck. The trouble in giving treatment for croup is that it is generally found in little children who object to such treatment. Main treatment should be directed to loosening the styloid and superior hyoid muscles.

Q. Would you use salt water?

A. Yes, sir, that is very good.

Q. What would you do in membranous croup?

A. You must be very careful in cases of membranous croup. Cause the patient to throw up. Thrust the finger down the throat and get the membrane in that way. If the membrane is far it will take very prompt action. Thoroughly treat about the throat to keep the circulation free and prevent the forming of the membrane.

Q. In catarrh of the throat would you give internal treatments?

A. Yes, sir.

Q. How often would you treat catarrh?

A. I would treat it three times a week. That will be sufficient.

Q. Would you treat internally that often?

A. No, sir, I would not treat internally oftener than once a week, or once in ten days, unless in severe cases.

In regard to colds, I have had cases where the cold was chronic and the condition of the system was weakened, in which I got good results by directing the patient to take a cold bath every morning. The brisk rubbing stimulates the circulation; not only does it stimulate the circulation, but it has a good effect on the nervous system, stimulating and strengthening the pores of the skin so that they can more readily open and close and accommodate themselves to changes in temperature.

LECTURE IX.

CONSTIPATION.

CONSTIPATION is defined as "infrequent or incomplete alvine evacuation, leading to retention of feces."—(Quain.)

With this, one of the most annoying, as well as one of the most frequent ills to which mankind is heir, Osteopathy has had most unqualified success. The ordinary sluggishness of the bowels that affects so many people is speedily relieved, ordinary constipation yields almost as readily, while some very marked and obstinate cases of years standing have been cured. I have known of a lady about thirty-five years of age constipated from birth, having never had a natural bowel action, to be entirely cured in six months' treatment. I have been told by one of our students that he had a case of a lady older than that, a lady eighty

years of age, who had never had a natural action of the bowels, whose case yielded to Osteopathic treatment. There are others as remarkable. Osteopathy seldom fails to cure constipation arising from the usual causes. Paralysis of the bowels, as seen in some cases of spinal disease, and in general paralysis, can be handled successfully only in such cases as will yield in regard to the general paralytic symptoms.*

In the matter of bowel evacuation, each individual's habit is a law unto himself. Some people are not well without two motions daily, others in perfect health, go as long as three days. Raue states that he has known women in perfect health to have but one evacuation per week. As a rule, one evacuation per diem is necessary to health. But it must be borne in mind that the daily evacuation is not conclusive evidence of non-retention of fecal matter. The quantity of the motion may be insufficient. Cases have been noted in which the walls and sacculi of the colon were impacted with old remnants, while a regular daily stool, normal in consistence and color, was made, passing thus through a channel whose walls were formed of old and hardened fecal masses. You will find in the retention of the fecal matter that there is an irritation of the bowel wall and a catarrhal condition arising from this irritation, hence it is that quite often there is an alternate constipated and diarrhoeal condition. The patient will have constipation for awhile and diarrhoea for a while. Dr. Harry Still tells us that he has found in his experience that if the liver is exceedingly tender, and he asks the question, "Are you not alternately troubled with constipation and a diarrhoeal condition?" the answer is usually yes.

Symptoms:—The head is dull and the brain lacks vigor, there may be headache, dizziness, palpitation of the heart, etc. There is often too free secretion of saliva; the appetite is increased or lessened. There is frequent biliousness, pain in the bowels and upon defecation, coldness of the extremities, backache, pains in the lower limbs, etc. The memory is poor, the head confused, the complexion sallow, and the breath bad. On the other hand, people with rosy complexions and every appearance of health may be chronic sufferers. Constipation is a symptom in a great number of diseases.

Aetiology:—General and Local:

General:—The causes of constipation are exceedingly numerous, and varied. Too concentrated a diet, e. g., milk, by leaving too little residue to act as an irritant to the bowel wall, stimulating it to action, becomes a cause. The same is true of too rich foods. Laziness, late hours in bed, and neglect of the regular hour are all causes. I have a patient who will be constipated every time she oversleeps, and remains long in bed, simply

*See Appendix 20.

because she has gone past the regular hour. I think this is a cause with men in business who do not take time to attend to the regular calls of nature. This is one of the most serious causes of the most obstinate cases of constipation you will meet.

In hereditary cases, the factors are weak bowel muscles and nerve supply. Robinson instances a case in which he says he was satisfied that the plexus of nerves, the inferior mesenteric ganglion was not sufficiently developed, and he went to work by proper exercises, horse-back riding, etc., to develop the ganglion. The child had inherited weak bowel walls and a weak ganglion. Weakened muscles result from anemia, etc. Loss of the fluids of the body, as in lactation, profuse sweating, and after diarrhea, in diabetes mellitus, etc., may frequently be causes. You must have a normal amount of fluid in the system. I have found cases in which a certain amount of water had to be prescribed daily in order for the patient to drink enough. Often the physician has to prescribe some sort of table water to get enough fluid into the system. Often I prescribe water to be taken in the morning before breakfast, not at breakfast but fifteen minutes or a half hour before.

The use of foods leaving coarse, dry residue, e. g., corn and beans; the use of strong purgative medicines, etc., and any cause lessening peristaltic action of the bowels may cause constipation. People frequently take a teaspoonful of salt in the morning, washing it down with a cup of water. It will do all right for awhile, but it will dry the bowel, and the powerful action of the salt exhausts the blood vessels supplying the bowel, so always discourage the use of salt by a patient.

The styptic quality of the tannin contained in tea acts as a constipator by lessening their secretions. Lessening or change in the quality of the bowel secretions and the secretions of the liver and pancreas, cause constipation by robbing the bowel of the stimulus gained from the action of these fluids upon the nerve terminals.

Too great muscular activity, nervousness, excessive mental application, are all aetiological factors.

Among the *local* causes may be mentioned mechanical agents, e. g., a displaced coccyx, a tightened sphincter ani muscle, pressure of a pelvic tumor, or of a gravid or misplaced uterus, impactions of the colon, stricture from peritoneal adhesion or hernia; mechanical stoppage by the presence of foreign bodies like grape seeds, fruit stones, etc. When you have peritoneal adhesion you may have a serious case, because that may progress enough to stop the bowel entirely.

Osteopathic Theory:—Mechanical causes aside, the Osteopathic theory in regard to constipation is that some lesion to the spine prevents proper action of the innervation or of the blood flow of the bowel, leaving it weak and ready to yield to any of the above mentioned general causes

of constipation. Auerbach's plexus, ruling bowel motion, and Meissner's plexus, ruling bowel secretion, are intimately connected with the sympathetics of the abdomen. These sympathetics may be hindered in action by some spinal obstruction of a nature and in a manner previously described. Thus either secretion, or motion, or both, may be affected and constipation result. Or, since the blood flow is under control of the sympathetics, the lesion may readily affect it and cause the trouble. Hare (*Practical Therapeutics*, p. 489) says, "Experiments have shown that the circulation of the blood through the intestines greatly influences peristalsis, and disorders in the blood supply readily bring on intestinal disorder." He also says that "peristalsis is almost entirely a reflex action, depending for its existence upon the integrity of the nervous plexuses in the intestinal walls, namely those of Auerbach and Meissner." Hence effects upon these plexuses by lesion of their sympathetic connections might be of such a nature as to result in constipation.

It is evident that lesion to the spine anywhere in the splanchnic area, fifth to the twelfth dorsal, or below, might be the cause of constipation, but Osteopathic practice has designated certain important points in the spine at which lesion is likely to be followed by constipation. Such are the second lumbar, fourth and fifth lumbar, and fourth sacral. The latter point is significant because the fourth sacral nerve controls the sphincter ani muscle, and lesion of it may so affect the nerve as to cause undue contraction of the sphincter, and thus act as a mechanical cause of constipation.

Lesions of the splanchnics or solar plexus, affecting the liver and the pancreas and their secretions, also become causes of constipation.

Byron Robinson has lately written (*Medical Brief*) very clearly upon constipation as a neurosis of the fecal reservoir, as he calls the left half of the transverse colon, the descending colon and the sigmoid flexure. He makes a very interesting point, that the small intestine and large intestine, (the ascending colon and the right half of the transverse part) are subject to a quicker rhythmic action from their innervation than is the remaining part of the bowel, which is described as the fecal reservoir.

This portion of the colon is under control of the inferior mesenteric ganglion situated upon the inferior mesenteric artery, and sending its branches to the intestines. Muscular atrophy of the bowel walls must be referred to these nerves, since they control the lumen of the blood vessels.

The abdominal brain may be abnormally small in some persons, be under developed and thus allow of insufficient bowel action.

Neurasthenia, also deficient blood supply to the parenchymal ganglia of Auerbach's and Meissner's plexuses are frequent causes of constipation. In these cases of neurasthenia which you will meet, you will usually find constipation as a factor, and you will become able to recognize and

ask at once if the patient has constipation. Simple observation is a great thing to put you on the right track.

The movements of the intestines largely depend, he says, upon the amount of fresh blood sent to these ganglia. Peristalsis, so far from being impaired in constipation, may be increased, but be in vain.

A checked blood flow, or a lack of blood, as in anemia, becomes a cause.

An empty bowel is a still one, a full bowel an active one.

The irritation which increases peristalsis may also narrow the lumen of the blood vessels, lessen secretions and cause constipation.

In enteroptosis the weakened ligamentous portions of the omenta elongate and allow the organs, including the intestines and stomach, to sink downward from their natural positions. This weakness of the ligaments begins from loss of tone in the abdominal sympathetics, and you must as Osteopaths, as a rule, refer that to lesions along the spine. I think I have thoroughly explained that point before. By the gravitation of the organs downward, the nerve plexuses and fibres are stretched and still further weakened. The enteroptosis allows of kinking of the colon, especially at the splenic and hepatic flexures, and becomes thus a mechanical cause of constipation. It also interferes with the blood and nerve supply to the intestines, hinders muscular action, lessens secretion and absorption and thus becomes a prolific source of constipation and of other ills.

Osteopathy also looks upon constipation as a "neurosis of the fecal reservoir." It recognizes the importance of free blood supply to the muscles of the intestines that they may not atrophy, also of free supply of blood to the parenchymal ganglia situated within the walls of the intestines, that they may thus be stimulated to normal action. By affecting the sympathetic connections, by adjusting all abnormalities that may interfere with blood and nerve flow, Osteopathy preserves the integrity of bowel action.

It looks upon the weakness of the sympathetics that allows of enteroptosis and of its concomitant ills, as due to some spinal lesion which either directly or indirectly affects and weakens sympathetic life. I make that broad statement; of course I know as well as any one that you do not always find spinal lesions in constipation, but in general that is the explanation we give and in general that is correct. You may have torpid liver which may in itself be a cause for constipation.

Excepting cases of constipation caused by mechanical agents, the system would not be subject to the operation of the general causes assigned for constipation, were spinal life perfectly adjusted and maintained.

Treatment.—It is divided into (a) upon the spine; (b) upon the abdomen; (c) upon the neck; (d) upon the coccyx and local, and (e) adjuvants.

(a) The purpose of the former is to remove any lesion that may be interfering with sympathetic life or cerebro-spinal nerve life of the bowel. You may have, of course, as you understand, some irritation along the spine which interferes with nerve life, so when I examine in case of constipation I always look for a lesion. You may find affected in constipation the splanchnic area and the region below as far down as the sacral. All of these lesions I described in treating the spine. It may be a contracted muscle, a slip of a vertebra, something which alters the curves of the spine, or any one of these lesions described. It may occur along the spine, so make examination in the areas mentioned. I come to the second lumbar, and I often do not find it out of place. I believe I have already shown you the treatment for the second lumbar. Make the second lumbar a fixed point, counting up from the sacrum below, by placing the thumb and doubled finger against it, and push up against the thigh; then take the other hand at the same place and make a fixed point at the second lumbar while you raise the upper part of the body and rotate it around this fixed point, thus effectually loosening any contracture of the ligaments.

The third and fourth lumbar are particularly significant to us, and the fifth lumbar as well, since lesions there may affect the hypogastric plexus, and we work there especially to affect the lower hypogastric and pelvic plexuses. Do not forget to attend to the splanchnic area and all of the sympathetic connections here with all of the nerve mechanism of the bowel. You know between the eighth and ninth dorsal is the center given for the liver, so always work along that region in constipation. I never stop my treatment for constipation without raising the eighth to twelfth ribs on the right side, and usually it is after I have treated the liver; with the patient on his back, I reach across, grasping the right arm of the patient with my right hand, and then raise it, and work it up and back to raise the ribs.

Why do we work upon the liver? Because we wish to keep the flow of bile free. It seems that the bile is one of the best lubricants for the intestines, and has a great deal to do with the normal stimulation. At the fourth sacral, desensitize if you have any reason for supposing the sphincter ani is affected. You determine this by a digital examination. Note the first to fourth lumbar for the large intestines. Peristalsis particularly at the ninth, tenth and eleventh dorsal, either by raising the lower ribs or by springing the spine and strengthening that region in the ordinary way.

(b) The treatment over the ABDOMEN. I work at the solar plexus in constipation. It is closely associated with the bowel at a point about

midway between the umbilicus and the ensiform appendix: by deep pressure in this region you can usually, by going slowly, bring considerable pressure upon that point. In people with bowel trouble, and in dyspeptics, you will usually find it quite tender. Do not be rough, but you can push in deeply and stimulate these centers. Thus you reach important connections not only with the intestines but also with the liver. Also reach the hypogastric and pelvic plexuses by working along the third, fourth and fifth lumbar, and by working through the abdomen in front.

Also, there is mechanical work that we can do along the line of the colon. Usually it is best to begin at the left in the region of the sigmoid flexure and work up to the ribs, then across above the umbilicus to the corresponding region on the right, and on down to the right iliac fossa. You work along the line of the colon and get such mechanical effect. But as I said before, that is not the only effect we get, we stimulate the bowel walls, stimulating Auerbach's and Meissner's plexuses in the bowel wall, thus reaching the nerve supply.

Further, it is important to straighten the bowel and keep it free. We reach in deeply at the iliac fossa and straighten out the sigmoid; work up against the course of the bowel and tend to straighten it. You can sometimes obtain good results in swelling of the lower limbs by reaching in here deeply and raising the intestines, thus relieving the femoral blood vessels. Now, I always work upon the liver, that of course is one of the important points in constipation. Have the patient with the knees flexed and lying evenly disposed upon the table. Taking the left hand, I insert my fingers under the edge of the right ribs against the edge of the liver. You must be careful not to bruise the liver. You can also get a squeezing motion upon the liver by reaching in below the right side and working on top of the ribs in front, and pressing the liver. Then we work along the course of the bile duct. This is upon the right as you know, curved in the shape of a reversed S, so we work back along the S with the idea of freeing it. Sometimes in catarrhal conditions you will have a mucous plug formed and the duct stopped.

Also I stimulate the inferior mesenteric ganglion by working the bowel a little below and to the left of the umbilicus. This is important, since as we see, this ganglion controls the part of the colon described as the fecal reservoir.

(c) The treatment in the NECK. Hare says, "The vagus nerves when stimulated directly or reflexly increase peristalsis." Always in constipation we stimulate the pneumogastric, thereby increasing the peristalsis, in two ways, one by working along the sterno-mastoid muscle, and the other working upon the superior cervical ganglion, which we reach at the sub-occipital fossa.

(d) LOCAL:—Adjust the coccyx if displaced. Sometimes external manipulation is sufficient; sometimes, and usually, internal manipulation must be employed in the manner already described, but always in case of constipation see that the coccyx is perfectly disposed that it may not act as a mechanical impediment to the passage of fecal matter. A further local treatment is dilation of the rectum, relaxing the sphincter muscle. This treatment is applied simply by insertion of the index finger and by a spreading motion. It should not be given oftener than once a week, or once in ten days or two weeks. This rectal dilation is a great stimulation to the sympathetic system and not only for normal bowel action, but it is frequently resorted to to stimulate the lungs. In case of a patient sinking under anesthesia, one of the quickest and simplest ways to restore the patient is by rectal dilatation.

(e) Adjuvants:—Remember that I simply give these to you as aids to your Osteopathic work, they are not Osteopathy. If they were more frequently employed, fewer would suffer from this complaint. The use of water is of great benefit. The drinking of cold or warm water fifteen or twenty minutes or half an hour before breakfast is often sufficient to cause a full evacuation. It should not be taken with the breakfast as it does no good then. The theory is explained that when the stomach is empty a portion of the water, at least, is not absorbed directly from the stomach as water ordinarily is, but passes on into the small intestines and is there absorbed by the lacteals and carried into the portal circulation and stimulates the flow of bile. Often a good drink of water upon retiring will accomplish the same purpose. We frequently use anemas of hot or cold water. It is said that a small anema of cold water is a great stimulation, though anemas are usually given of water as hot as can be well borne. It should be given by a fountain syringe, the patient lying upon the back or upon the right side, having the syringe hung at a height of six feet to insure a sufficient fall. About a pint should be given and the patient should immediately void this. The operation is repeated, this time giving one quart, three pints or even more of water. Stimulate gently by working the abdomen, in order that the water may be taken up into the bowel. The patient should now retain this as long as possible in order that the fecal matter may be well softened. Many make a mistake in voiding the water before it has been held sufficient time to act as a solvent of the fecal masses which may have been quite hard. When he has held it as long as possible, usually that will not be but a few minutes, he should void it, and ordinarily the result will be satisfactory. Sometimes your patient will not be able to pass the water, but if retained it does nothing but good, as it is acting continually as a solvent and will probably within a few hours lead to

a profuse action, but if it does not it is readily absorbed and carried out through the kidneys and bladder.

Drinking of carbonated and sulphur waters usually develops some good conditions. Usually in sulphur water there is magnesium which has an aperient action. Graham bread contains salts which stimulate the normal action of the bowels, also the roughness of the remnants of the bran is of itself a good stimulation of the bowel walls. Cracked wheat, oatmeal, vegetables, whole wheat bread, etc., are all alike valuable foods. Now, remember that one may take too great quantities of these foods and become constipated.

Again fruits are a great help. I will mention first such as are constipating and should be avoided, such as strawberries, blackberries and raspberries. Raspberry juice is frequently given in case of diarrhoea, where you readily note its constipating effect. But such fruits as apples, grapes (no seeds), stewed prunes, figs, dates, and juicy fruits, especially before breakfast, or the first thing at breakfast, are laxative. These are all valuable, apples perhaps the most so, though different people are affected differently. It would seem, however, that apples, prunes and dates are to be given the preference.

Regular habits should be encouraged. Defecation is found to be largely a matter of habit, acquired generations back and passed on from generation to generation. A certain hour should be fixed for the stool, and the patient at least go and try to produce evacuation, never, however, straining as that may produce hemorrhoids, but by thus fixing the habit and placing the mind on the desired end, you control the cerebral centers.

Aside from the regular habit of going to stool, certain exercises are beneficial; remember first, however, that violent muscular exercise is given as one of the causes of constipation, and have your patient carefully avoid fatigue in exercise. The following exercises are recommended:

First the stooping motion, the patient bending the knees, keeping the back straight, stooping down and raising, brings a pressing or squeezing motion upon the liver. He may, in bending downward, bend forward until the shoulders touch the knees. The same effect is accomplished by the patient getting down on all fours and running about the room. This seems to be a natural way of massaging the liver. The patient may, when he awakens in the morning, while lying upon the back, tap and massage the abdomen gently and thoroughly and thus stimulate the blood and nerve force of the bowel and gain the desired end.

Horseback riding and ordinary enjoyable exercises are all very good.

LECTURE X.

DIARRHOEA AND DYSENTERY.

The success of Osteopathic treatment in both Diarrhœa and Dysentery is marked. As a rule, the copious evacuation of acute Diarrhœa is checked immediately upon the first treatment, though frequently cases need more than one treatment, and sometimes become obstinate and chronic, requiring months.

Dysentery, although a more serious condition, being essentially an inflammation of the bowels, yields readily to our treatment. The treatment is similar in both cases.

Both of these conditions will illustrate, in their treatment, two points in Osteopathic theory: First, the condition of the spine as a predisposition to disease; second, the remarkable control gained over visceral life by manipulation of the controlling nerves.

DIARRHOEA is regarded by some writers as a symptom merely of intestinal derangement, by others as a distinct disease. The word means "to run through," and as Hare observes is loosely applied to all states of intestinal disturbance accompanied by liquid stools.

Ætiology.—Hare notes four varieties of Diarrhœa: 1. Catarrh of the intestines, leading to profuse secretion and passage of mucous. Irritation set up by old fecal matter may be enough to set up inflammation resulting in a discharge so that you may have alteration of diarrhœa and constipation. 2. Lack of proper innervation of the blood vessels allows of an outpouring of liquid from them into the intestines. Right here you must guard against an error frequently made by some who treat Diarrhœa as if it were caused solely by too rapid peristalsis. They make the same mistake as is made in considering constipation always to be a lack of peristalsis. It should be considered simply as one of the classes. 3. Improper condition of the glands leads to improper preparation of the digestive fluids, and, 4. Ulceration, causing irritation and bloody purging.

Byron Robinson notes the fact that Diarrhœa may start as congestion, leading to oedema, rapid exudation, and Diarrhœa. Thus, catching cold frequently affects the bowels in this way, particularly in young children. He further points out that increased peristalsis may be accompanied by too profuse secretion and exudation, but that on the other hand, increased peristalsis may be accompanied by narrowing of the calibre of the blood vessels and lessened secretion. Thus the irritation that causes the increased vermicular motion may cause constipation instead of diarrhœa. Such causes as influence intestinal peristalsis are important to the Osteopath, as he finds in spinal abnormalities the frequent cause of nervous irritation leading to diarrhœa or to constipation.

The processes of secretion and absorption normally balancing each other, may, says Robinsson, become disarranged through the irritation of the bowel segments, e. g., by cathartic medicines. Owing to the increased peristalsis, not enough time is allowed for absorption of the secretions, and they are hurried through the bowel in the form of liquid stools.

Displacement of spinal parts, etc., may be the cause of such irritation, as our practice frequently shows.

The same author shows that catarrh of the intestinal mucous membrane may so affect intestinal secretions in quantity and character as to alternately cause Diarrhoea and Constipation.

Dr. Harry Still says that in cases where he finds the liver extremely tender, he usually finds diarrhoea and constipation alternating.

Causes of Diarrhoea are predisposing and exciting.

Predisposing causes are heredity, personal idiosyncrasy, time of life, e. g., teething and the climacteric; and, from the Osteopathic point of view, spinal conditions, any obstruction or irritation of blood or nerve life of the intestines.

Exciting causes are:—(Quain.)

1. Direct irritation, as by poorly digested food upon the intestinal walls; entozoa; excessive bile, or retained fecal matter.
2. Bad hygiene, as living in damp, badly lighted and poorly ventilated quarters.
3. Exposure, wet feet, sudden atmospheric change, etc.
4. Nervous causes, e. g., depression, worry, shock, grief, reflex irritation in dentition.
5. Altered peristalsis and secretions.
6. General diseases; e. g., of the heart, liver, lungs, pyæmia, peritonitis, obstruction of the portal vein, measles, scarlatina, typhoid, etc. (*Symptomatic Diarrhoea.*)

*Osteopathic Theory:—*While admitting the potency of varied agencies to cause Diarrhoea, the Osteopath believes that most cases can be accounted for, either remotely or directly, by some abnormal condition of some part of the spine, particularly of the splanchnic area and of the lower region of the spine. A spinal lesion of any nature, may be of such a character as to influence the nervous mechanism controlling the whole of the intestinal life, and the result may be violent and rapid peristalsis, vaso-dilatation of the mesenteric vessels, followed by increased exudations, abnormal glandular activity, producing perverted or needless secretions of intestinal juices, or inflammation and catarrhal affection of the mucous membranes, as pointed out above.

As a predisposing cause, bad spinal condition stands pre-eminent. If the exciting cause be error in diet, exposure, undue nervous excite-

ment, unhygienic surroundings, or a general disease, it may still be true that the bad spinal condition allows of a weakness of such a nature as to be readily developed into Diarrhœa by any one of those causes acting in conjunction therewith.

Granted that in certain cases, e. g., when Diarrhœa is purely symptomatic, no such remote causes can be found in the spine primarily, yet because treatment at the proper spinal position will overcome the symptom, the theory still holds good so far as to direct the operator to the origin of nerves governing the part affected, while contracted muscles, caused secondarily by irritation sent outward from the bowel through nerve connections to them, frequently indicate to us the proper point of treatment upon the spine.

DYSENTERY (*Bloody Flux*):—This is a febrile disease characterized by intestinal inflammation, the passage of blood, mucous, etc., and great prostration. It occurs epidemically or sporadically, and attacks males and females of all ages.

Actiology:—The causes of Dysentery seem to operate most freely in tropical climates, in damp or swampy localities. It is said to generally occur in regions which are prone to malarial infection, and that malaria seems to predispose to it by abdominal congestion, engorgement of the liver and spleen, and digestive derangement. Hence it is to some extent a constitutional disease. It is seen in greatest virulence in army camps and hospitals, where it best manifests its epidemic character.

Sporadic cases are usually caused by some indiscretion in diet, by sudden chilling of the body, wet feet, etc. Impure drinking water, bad air, undigested particles of food, and sudden changes in temperature which cause internal congestions, are all assigned as causes.

It is stated that Virchow considers the epidemic form to be of a diphtheritic nature and the sporadic form of a catarrhal nature.

The epidemic form is held by some to be contagious, but this is a mooted question.

Pathology:—This is a disease of the large intestine, but may extend beyond the ilio-cæcal valve into the small intestine. The first change is a reddening and swelling of the mucous membrane which peels off and is passed in the stools.

Ulceration may attack and destroy the solitary glands, spreading thence to the tubular glands. From these ulcerations perforation of the bowel may occur. The ilio-cæcal valve is sometimes destroyed when the dysentery is gangrenous, and invagination follows. Ordinarily the whole surface of the mucous membrane becomes colored with a dirty, varicolored slime, mixed with epithelial, blood, and pus cells, and causing very offensive stools. Sometimes the mucous membrane decays, is sloughed off and passed.

Inflammation extends to the peritoneum and involves the mesenteric glands. It is said that the ulcerated tissue is probably never restored, and that occasionally serious contractions of the gut, or stricture, may follow the healing of the ulcers.

Symptoms.—There are at first general constitutional and digestive disturbances. Chilliness, malaise, fever in the evening, dry skin, constipation or relaxation of the bowels, anxious expression, occasionally retention of urine, and offensive stools are among the symptoms.

The tongue is furred; there is a thirst and bad taste; evacuation is accompanied with great pain followed by tenesmus, a bearing down feeling of the rectum; tormina or griping, is usually present.

The stool is characteristic; described by Rauc as being first liquid, with transparent, jelly-like clots of slime, like boiled sago. This matter is tinged with blood, contains little or no fecal matter, and later becomes thin, dirty white and watery. The stool may become clear blood. The decaying membranes and ulcers give it a particularly offensive odor. Twenty, thirty or more stools are had in twenty-four hours.

The attack is likely to prove fatal, and we must guard against such unfavorable symptoms as hemorrhage, cold skin, great prostration, livid and blue countenance, collapsed abdominal walls, peritonitis, pneumonia, erysipelas, bed sore and hepatic ulcer.

Osteopathic Theory.—Some spinal lesion, especially at the splanchnic area or at the third and fourth lumbar, disarranges blood and nerve supply to the intestines, thus acting as a predisposing cause, rendering the system more susceptible to the influence of poor diet, climatic change or contagion.

Treatment.—Look for lesion along the splanchnics, and see that the coccyx is straight. There seems to be a special significance attached to the 11th and 12th dorsal. These seem to be centers particularly for peristalsis, or lesions of the 11th and 12th ribs may influence these centers. The treatment for Diarrhoea is very simple. I place the patient upon the side and work along the lumbar region, springing the spine strongly. I do not hesitate to make it strong. Place the knees of the patient against you and give a very strong treatment. If the patient is a small man sometimes you can raise him off the table, and that will not be too strong a treatment. Of course you will have to gauge your treatment according to the condition of the patient. I work that way all along from the lower lumbar as high as to the sixth dorsal. I hold for a minute or two, then I turn the patient over onto the other side and repeat the operation. Some operators think that by treating just on the right side they get good results. I think it is simply a matter of desensitizing the spine—inhibiting the nerves. Of course that sounds like the theory entirely of peristalsis, but you rule the vaso-

motor action there, and you get effect upon the liver, spleen and solar plexus.

With the patient upon the back I raise the 11th and 12th ribs, or with the patient upon his side I work in at the point of the 11th and 12th ribs. Putting the thumb against the angle you can hold there strongly, with the idea of inhibiting nerve action.

I never hesitate to have a good flow of bile to the intestines in case of Diarrhœa. The theory is that we work on the bile to stimulate its flow to the bowel, and you will find that it will act to allay irritation. I work on the course of the bile duct to insure a freedom of the flow of bile to the intestines. It will never do any harm in the case of diarrhœa or dysentery, as well as in case of constipation. This then is the general treatment in cases of diarrhœa, dysentery, and similar troubles. Now, if it is a severe case of dysentery, when you work upon the abdomen you must be careful not to run any risk of perforation, which is likely to occur. I work over the bowel as in typhoid fever, simply to relax the tissues and free the flow of fluids, reaching the hypogastric plexus. In chronic cases, where there is inflammation of the bowel, you will find the bowel contracted, and then by working gently but deeply over the site of the contracture you can relax. I am treating a case now of long standing. There is a contraction of the bowel on one side or on the other. . It may be on the right, or may be on the left, varying from time to time. I work on the centers along the spine. I spent considerable time one morning in giving the treatment, in trying to relax this condition. I worked from the middle dorsal down, but none of it seemed to do as much good as to get directly to the seat of the contracture by working in the abdomen. You may say that tends more to massage than to Osteopathy. That is true so far as that case is concerned, but differs in having the origin of the trouble in the spine.

We work first upon the *spine*, second upon the *abdomen*; we also work upon the *neck* to inhibit the pneumogastric. Stimulation of the pneumogastric will increase the peristalsis, according to Hare. You bring pressure upon these nerves by working along the mastoid muscle. You must make local examination and satisfy yourself that the coccyx is straight. Sometimes it is displaced and is the cause of the trouble.

In case of rectal troubles you must, of course, treat the sacral nerves, as they have to do with the rectum.

Also there are certain ADJUVANTS which we may use. Quiet and rest in bed in severe cases, with proper care as to diet; meat broths, tepid (not hot) water, as hot water or hot liquid food will excite peristalsis. Use milk with lime water, also mucilaginous drinks such as white of egg in water, milk, rice or barley water. Avoid fruits, except such as are con-

stipating, e. g., blackberries and strawberries. Tea is an astringent. Strong tea and toast may be given.

It is simply common sense adjuvant methods that are used. One should not include these in Osteopathic treatment unless necessary. Ordinary cases of diarrhœa you will be able to stop with the treatment alone.

As to Dysentery, the same general treatment given above will apply. You must, however, give a more general spinal treatment, especially for the liver, spleen, stomach and intestine. Dr. McConnel has said that there is invariably a lesion at the 3d and 4th lumbar in case of dysentery. Get the liver active. Frequently you can relieve portal congestion and do away with danger in that direction.

In *tormina* I sometimes bring deep pressure over the solar plexus, but usually work upon the splanchnics. I have the patient upon the side, or upon a chair, and spring all along. This is the ordinary griping in the intestines.

For the bearing down feeling in the rectum, strong stimulation in the sacral region will be sufficient. Sometimes it is necessary to give an anema, and then tepid water should be used. A mustard plaster may be good to relieve, but it should not be left on over twenty minutes, not long enough to blister. I have before mentioned that the patient should not be allowed to drink a quantity of liquid at once. Just a few spoonfuls of water should be given at a time to relieve thirst.

Question. In treating the pneumogastric do you inhibit or stimulate?

Answer. The general way is to hold strongly against the mastoid muscle. We do not depend simply upon the pneumogastric in these troubles. I have not found that I could do so.

Question. How often do you give treatments for diarrhœa?

Answer. I treat such cases several times a day. It is owing to the nature of the case. If it is an acute case you must keep after it. Treat three or four or a half a dozen times a day.

Question. Would it do to give cracked ice instead of water to quench thirst?

Answer. Yes, that would do in small quantities.

LECTURE XI.

Massage, Swedish Movement and Manual Treatment:—These are all forms of mechanical therapeutics. All are, at least in part, manual systems, the treatment being administered with the hands. In each system not only manipulative procedure is employed, but also gymnastics are used, i. e., passive, resisted, or free movements on the part of the patient.

Massage seems to consist largely of manipulations made by the operator on the patient's body, while Swedish movement, though including these manipulations, makes prominent the active gymnastics of the patient and is called also Medical Gymnastics.

The system of manual treatment ascribed to Ling, a Swede, seems to be a more thorough form of massage in which the manipulations predominate, but including also certain active movements on the part of the patient.

In general, these systems are but little understood, and are far more thorough as methods of healing than is generally supposed. In the hands of skillful operators, usually doctors of medicine, remarkable results have been accomplished in the cure of disease. These systems are generally employed by masseurs without technical education, and thus have come to be generally misunderstood; being as a rule unskillfully applied, and by unscientific operators, the results have not been such as the systems are capable of producing. However, none of these forms of treatment are Osteopathy; all differ from it radically, yet since they are systems of manipulative therapeutics, and since, unavoidably in any such general mode of treatment, there are certain resemblances in method, in manner, or in results, Osteopathy has been frequently confounded with these other methods.

Massage is the general term used by the average man to designate all forms of manual treatment, hence Osteopathy has become to him massage.

In Eccles' "Practice of Massage" five different forms of manipulation are described, as follows:

1. *Effleurage*, or stroking; for effects upon the skin; given in a centripetal direction to aid the flow of lymph and blood toward the heart.

2. *Pétrissage*, or kneading; deeper than stroking; for effect upon skin and muscle in direction of blood flow to the heart, and for the purpose of squeezing out the waste from the tissues. It stimulates lymph and blood flow.

3. *Tapotement*, or tapping, clapping or hacking. This is given with the dorsal surface of the second and third phalanges, or with the ulnar or radial border of the hand, for the purpose of affecting deeper structures, i. e., for stimulation.

4. *Vibration*, a quick vibratory motion, variously administered, given over chest, abdomen, nerve trunks, etc., for stimulation of the deeper viscera or nerves.

5. *Massage à friction*, a sort of circular friction, generally employed about joints to soften tissues and muscles; said to be very useful in sprains, strains and rheumatism.

These five forms of motion, sometimes more, are described by the different authors. There is much variation in the technique. Usually a masseur, after a course of study, will throw aside his books and adopt a system

of motions of his own. Yet, unlike in Osteopathy, the manual of technique, or the exact mode of administering the various movements, is made very important by the authors. One example will illustrate the detail with which these motions are described, and the careful attention that is bestowed upon the manner of giving the treatment:

"The rubber, remaining upon the left side of the couch, uncovers the left lower limb, and with the right hand delivers a series of rapid frictions from the toes upward over the dorsum of the foot, external surface of the leg, the knee, and front and external surface of the thigh; then with the left hand, the knee being semi-flexed and the thigh slightly abducted and rotated outward, the sole of the foot, calf, inner side of the knee and thigh, are also lightly and briskly rubbed; then, re-covering the limb, and exposing the foot and ankle only, the more detailed treatment of the foot is given. Supporting the sole of the foot in the palm of the left hand, the heel resting in the semi-flexed fingers, friction over the dorsum of the foot and the front and outer surface of the ankle is performed in much the same manner as that of the back of the hand."

The masseur thus goes over the body in detail in general treatments. There is special massage for the limbs, the heart, the lungs, the eyes, the face, the ear, the head, the bladder, intestines, etc.

The time required for treatment varies from a few moments to three quarters of an hour or an hour and a quarter.

In addition to the movements described, massage includes voluntary motions by the patient, sometimes aided, sometimes free, sometimes resisted by the operator. These come after the passive massaging, and are for the effects of exercise or to develop any special part.

SWEDISH MOVEMENT is, according to Dr. J. H. Kellogg, a "system of medical gymnastics," a "physiological mode of treatment of disease." As indicated by this definition, the system consists largely of active gymnastic exercise upon the part of the patient. Massage, Dr. Kellogg terms a special feature of the Swedish movement. He states the principle of Swedish movements, "that muscular movements are a powerful means of affecting physiological processes and that when gymnastics are used therapeutically, they must be employed with the same accuracy and precision with which the physician regulates the doses of medicinal agents." Thus we see that the idea of gymnastics is made prominent. Incidentally, the movement already described as massage, and other passive movements are used. Such are hacking, clapping, beating, stroking, kneading, fulling, sawing, etc. A great variety of movements are indicated and fully described, certain physiological effects being expected from a given definite movement. Compound words are used, and the terms read something as follows: "(1) Sitting, chest-lifting; (2) half-lying, foot-rolling; (3) high-ride sitting, trunk-rolling; (4) fan-sitting, arm-rolling," etc.

The above is taken from a receipt of movements given for congestion of the brain.

Peter Henrik Ling, the Swede, is credited with being the originator of a system of Swedish movements. A work called Ling's "System of Manual Treatment" gives more prominence to the manipulations of the operator, but describes also active movements to be made by the patient.

The idea prevalent among us that massage does not require a knowledge of anatomy is a mistake.

These systems are founded upon a most thorough knowledge of Anatomy, Physiology and Physical Diagnosis. Yet it is probably true that massage and the like, as usually administered, are in the hands of persons who have but a superficial knowledge of these sciences.

These forms of treatment are given in both acute and chronic conditions with important results.

In Swedish movements, motions are indicated for laxative effect, for abdominal disease, hæmorrhoids, frequent menstruation, etc. A long list of receipts of combinations of motions is given for such conditions, e. g., as Anemia and Chlorosis; Scrofula, Diabetes, Mellitus, Hysterics, Tremors, Colic, Bright's Disease, Pott's Disease, Prolapsus Uteri, Leucorrhœa, etc.

The effects of manual treatment are interesting. Passive movements act upon venous and lymphatic circulation, and are made in the direction of these currents.

Stroking stimulates the pilo-motor nerves, leads to a contraction of the arrectores-pili muscles which causes the sebaceous follicles to be pressed upon, thus aiding secretion.

By rubbing, rolling and squeezing of the skin, the superficial circulation is stimulated, the capillaries dilated, and the pulse-rate slowed.

Firm kneading of the muscle is followed by a slow pulse beat, and in case a large muscular mass is kneaded, a fall of blood pressure in the body is noted. Eccles states that "it is possible that pain occurring in the deeper organs may be modified by manipulation over the superficial areas corresponding to the distribution of the cutaneous sensory nerves derived from the same segment of the spinal cord as that from which the sensory nerves of the disturbed viscus are derived." Thus effects may be gotten upon the heart and lungs by external work. He summarizes the effects of massage as follows:

1. "Mechanically and directly, elimination of waste products from the tissues under manipulation is increased, the absorption of exudations and infiltrations is greatly favored, adhesions are attenuated, sometimes broken down, and even organized thickenings may be reduced.

2. Nutrition of the part is improved, vascularization is increased, and metabolism is augmented.

3. Indirectly, massage acts as a derivative, relieving congestion of the internal organs by attracting the flow of blood to the surface, and muscular vibrations are set up, stimulating the nervous system, acting through it reflexly, thus exciting secretion; while on the other hand, its sedative influence relieves pain and reduces over activity."

Kellgren claims for nerve vibrations:

1. "Raising of the nervous energy.
2. "Diminution of pain [as seen in facial neuralgia and migraine.]
3. "Contraction of the smaller blood-vessels [heaviness of the head is quickly relieved by stimulation of the sensory nerves of the scalp.]
4. "Stimulation of the muscles to contraction.
5. "Increased secretions of the glands.
6. "Diminished excretion from the skin.
7. "Decrease of temperature [as in fevers.]"

These are given as examples of results claimed for manual treatment. Much more might be added.

Osteopathy is not Massage or Swedish Movements. While there are similarities, there are radical differences:

1. These other forms depend largely upon the general gymnastic or manipulative effect upon the body. Osteopathy does not depend upon general effects from general treatments, but upon scientific treatment.

2. They emphasize the *method of the motion* which, to the Osteopathy, is secondary. A good masseur must be an expert manipulator in the particular sense of having a knack to give certain movements.

3. They are much more laborious and require a much longer time per treatment than does Osteopathy. Sometimes a single motion is sufficient Osteopathic treatment, or effects a cure.

4. Osteopathy requires no gymnastics of the patient as a part of the treatment.

5. They go over the parts of the body in detail, which Osteopathy does not do except in examination.

6. They make no search for any lesion or abnormality about the bodily mechanism, while Osteopathy finds in such lesions, e. g., a misplaced part, the most scientific cause of disease.

7. They do not go to nerve centers and nerve distributions in the way that Osteopathy does. They work upon them in a general way and only because they are readily reached. They do not seek for and remove lesions therefrom. On the other hand, Osteopathy goes to the definite nerve centers to influence the health of the body, and often removes obstructions from such centers, allowing normal action. The same is true of blood flow.

In these last two points is seen the most radical difference between the systems. Upon the whole, these manual systems compare with Osteopathy as does the shot-gun with the rifle. They produce excellent results by the "shot-gun method" of general manipulation, while Osteopathy works with the definite aim of finding the obstruction to health and removing it. It is unavoidable that, if such a comparatively "hit-and-miss" method as massage can secure excellent results as a curative means, Osteopathy, with its definiteness, must generally far exceed massage in results. It also follows that Osteopathy must generally work more quickly and easily than massage in such cases as the latter could reach, and that it must succeed in a large class of cases beyond the power of these manual systems, since to this class belong so many disease conditions depending upon some removable obstruction not noticed by them.

APPENDIX.

1. Much might be said relative to the proper examination of the spine. Enough has already been said to emphasize its importance.

The position of the patient must be shifted during the course of spinal examination, inasmuch as some lesions, not apparent when the patient is sitting, become obvious when he lies upon his side, and vice versa.

In examining for "breaks," or separations between the spinous processes, the patient must be placed upon his side. The palmar surface of the distal phalanx of the examining finger may then be passed carefully along the spines, being held in a position at right angles to the spinal column. The finger being thus placed transversely between the successive pairs of spinous processes, can readily detect any separation or approximation.

On the other hand, slight lateral deviations or curvatures of the spinal column are often masked when the patient lies upon his side. These, and all similar lesions, are best detected when the patient is sitting, due care having been exercised in having him dispose both sides of the body alike. This is best accomplished by having him sit upon the operating table side-wise, in an upright position, with the hands placed in the same relative position upon the knees.

In preference to the method described in the text of passing the index and middle fingers of the examining hand down the opposite sides of the spinous processes, the author often uses the following: Both hands are closed, leaving the index fingers protruding. These are now placed upon the opposite sides of the spinous processes and passed carefully down the column, examining minutely each process in relation to each other process and to the column as a whole. Lateral deviations, tender points, contractions, etc., are thus readily detected.

Equal care must be exercised in examination of the thorax. One valuable method in general examination of the thorax is to have the patient lie upon his side, while the palmar surface of the examining hand is passed at one sweep along line of the angles of the ribs, from the shoulder downward to the twelfth rib.

With the patient in the same position, the inner or the outer side of the distal phalanx of the index, or examining, finger is thrust into the intercostal spaces, one at a time, being passed carefully along each space to discover narrowing or widening thereof.

2. A notable instance of transferred sensation was presented by one of my patients. She was suffering from partial deafness in both ears. A weak place was found in the lower dorsal and upper lumbar regions of the spine. She said that for a long time she had noticed that when musical notes of a certain pitch were struck in her hearing, she felt a distinct sharp or tingling sensation at the weak point of the spine.

3. A diagnostic point of some value is found in the fact that often slipped vertebrae in the lower cervical and upper lumbar regions cause rheumatism in the arms. One or several vertebrae in these regions may be found luxated, most often laterally; contractures occur in some of the fibres of the supra spinatus, rhomboid, levator anguli scapulae, and trapezius muscles, and may be traced from the spine toward the shoulder. These contractures, as a rule, are sore.

So frequently have I found cases of rheumatism presenting these lesions, that I invariably look for them in rheumatism in the upper extremities. On the other hand, finding such has often led me to question the patient in regard to his liability to rheumatism in these members, with the reply usually that such liability is present.

4. The Osteopath is much impressed with the force of certain statements made by Simon Baruch in his "Hydrotherapy," as showing how general and valuable a field of work the Osteopath has in working upon the surface of the body, thus attempting to influence the fluids and forces of the human system.

Baruch states that irritation of the cutaneous surface is conveyed inward upon reflex tracts to the vessel walls. This goes to prove the Osteopath's contention that by general manipulation of skin or muscles, by the relaxation of contractures in any given set of muscles, or by removal of superficial lesion, he may effect the state of the vascular system through these reflex tracts.

We daily make use of the fact that the medulla is the general vaso-motor center for the system. Baruch calls to mind the fact that it is the center ruling the vaso-motor supply of the peripheral vessels, stating that it is probable *that all sensory cutaneous nerves congregate in the vaso-motor center in the medulla, where they connect with the vaso-motor nerves of all the arteries of the body.*

If such is the fact, how easy it is for the Osteopath, by his manipulations, which are usually upon the exterior of the body, to profoundly effect either the general circulation, or the circulation of any specific part by the removal of specific lesion!

Further, he states that the nerves supplying the Pia receive constant excitation from the cutaneous nerves. This will aid in explaining the almost magic results we so often attain in cases of nervousness, and in cases of all kinds suffering from deficient nutrition of the whole or parts

of the nervous system. Cases that do not come under this category are very few.

Finally, the author we quote says that results obtained through cutaneous stimulation by various hydrotherapeutic procedures are not transitory, but last several hours.

This certainly should be as true of Osteopathic results as of those gained by the application of water, as far as general manipulation goes. While following the removal of specific lesions, they must remain as permanent results.

He states that feeble cutaneous stimulants modify energy of cardiac contractions and increase their number, while powerful stimulants increase their force and diminish their number. So the Osteopath may apply all of these facts to the explanation of the results he may get in stimulating or in inhibiting cardiac action.

I have frequently, by stimulation or inhibition of the accelerator fibres contained in the upper three or four dorsal nerves, modified or increased the heart's action. On the other hand, a deep, relaxing, inhibitive treatment of the abdomen will relax the vaso-motors contained in the various sympathetic abdominal plexuses, dilate the vast system of abdominal veins, said to be capable of accommodating at one time one-third of the bulk of the blood in the vascular system, call to these abdominal vessels the blood from other parts of the body, and result in quieting the pulse-beat, or in diminishing the strength of the radial pulse.

These results I have frequently gotten before my classes, having several assistants counting the pulse in the various stages of the experiments. By use of these facts, important results may be gotten in relieving congestion in various parts of the body. I have, by the abdominal treatment, called the blood from the head, and relieved headache.

By strong stimulation of the abdominal plexuses the radial pulse may be increased.

5. A case in which the lesions were posterior and lateral prominence of the fourth and fifth dorsal vertebræ, complained of a feeling of irritation the length of the œsophagus, and distress of the stomach, particularly upon eating certain articles of diet, such as strawberries. Correction of the lesion was followed by immediate relief, but, as that portion of the spine was weak, recurrence of the lesion caused a return of the trouble. Relief was always felt upon correcting the condition of the spine.

6. In a few cases I have known of direct treatment upon lymphatic glands, not themselves involved in the disease, to give relief from the symptoms. An Osteopath claimed good results from direct stimulation of the axillary lymphatics in case of a sore throat. Another claimed marked results in a case of obesity by treating the glands directly, in the axilla, groin, popliteal space, etc.

7. The following rule is given for locating the great and small occipital and the great auricular nerves: Take the middle point of the posterior edge of the mastoid process, measuring thence upon a line at right angles thereto, and projected toward the back of the neck, a distance of about one inch, brings the operating finger to the particular point in the sub-occipital fossa where deep pressure best effects these three nerves. Strong pressure upon them causes a pain to run over the top of the head to the eye.

8. The supra-orbital branches of the fifth nerve run from the supra-orbital notches back toward the temples, forming an angle of about forty degrees with the line of the superciliary ridges. They may be easily felt beneath the tissues, and can be traced back as far as the temples. By friction over them, together with loosening of the tissues about them, an operator may get an important influence in relief of headache or facial neuralgia.

In the same way, Ling points out that one may relax the tissues along the mid-line of the skull, over the longitudinal sinus, down to the occipital protuberance, thence out along the lateral sinuses. This will influence cranial circulation, and is valuable in treatment of headaches, etc.

9. In examination of the eye some simple methods, as pointed out by Wood, are of much assistance. If a motion as of striking the patient in the face causes winking (winking reflex), it shows integrity of both the optic and facial nerves, they both coming into play in seeing the motion and in causing the muscles to contract.

In the same way the conjunctival reflex shows the integrity of the fifth and facial nerves. It is elicited by touching the conjunctiva with some soft object, such as a camel's-hair pencil. The reflex is intact if the touch rouses sensation and causes a shrinking of the muscles of the eyelid.

When one is unable to see an object directly in front of the eyes it indicates blindness in the central fibres of the chiasm. Hemianopsia, or blindness in part of the eye, indicates blindness in the fibres of the chiasm opposite to the side of the eye affected, e. g., blindness in the right half of the eye shows defect in the left fibres of the chiasm. By placing objects in the same relative position with respect to the eyes, hemianopsia may be diagnosed. Thus, if the patient is placed in a recumbent position upon the table, with his eyes fixed upon some object directly above him, while the operator gradually and equally raises his hands, one on either side of the head, should the right hand come into view of the corresponding eye before the left, the indication would be that hemianopsia was, affecting the inner fibres of the chiasm pertaining to the left eye, causing **blindness in the outer half of the eye.**

In several cases of hemianopsia which I have treated, vision improved rapidly.

10. Lesion of the atlas, second or third cervical vertebræ, may affect either sight or hearing. I have noted that in many cases the eye or ear on the side opposite to that toward which the vertebræ were directed was the sufferer. While this cannot be stated as a rule, it has been true in the majority of such cases coming to my notice.

11. Ling points out that the seventh cranial nerve is best exposed to manipulation at the point about midway of the outer surface of the ramus of the inferior maxillary bone. Here it crosses the bone horizontally, and pressure brought to bear transversely to its course can't fail to impinge upon it.

12. See Appendix 2.

13. In examination of the intercostal spaces one is likely to find, in cases of approximation of ribs, a tender point at the sternal end, one at the spinal end, and a third about midway. The reason for this is seen in the anatomy of the intercostal nerve, which gives off a cutaneous sensory branch at each of these points.

14. In examination of the first rib, its sternal end may be felt just below the sternal end of the clavicle. At this place the rib may be traced almost an inch, in many cases, until lost beneath the clavicle.

By deep pressure above and behind the clavicle, the rib is first felt at about the junction of the inner and middle thirds of the clavicle. Thence it may be traced well back below the trapezius muscle at the back of the neck. Here it is lost. Its head cannot be felt in the human subject, but deep pressure may be brought to bear upon it by carefully finding the seventh cervical spine, and by measuring out a full inch to the side of this spine.

In the same way deep pressure is brought upon the head of the second rib by measuring one inch outwards from the first dorsal spine, the head being masked by the thick muscles at the back of the neck.

A depression at the junction of the end of the first rib with the sternum usually indicates that this rib is raised, and thus drawn away from its articulation. A prominence at the same place indicates the reverse. Such points are often tender to the touch, and the tenderness may extend along the rib as far as the clavicle.

The first and second intercostal spaces are often broader than the others, and one must sometimes look lower than he would expect, to find the sternal end of the second rib. But all liability to error is usually removed by bearing in mind that the junction of the manubrium with the gladiolus is the landmark for the second rib.

15. See Appendix 6.

16. In deep abdominal manipulation great care should be used to avoid violence. With this precaution one may work deeply, with the flat of the palm, in the iliac fossæ. One hand may be laid flat upon the abdomen over the fossa, while the other hand presses the first deeply in. This gives one a check upon the degree of force used, and leaves the lower hand freer to exert sense of touch in examination. Deep pressure with the heel of the palm in one fossa, and upwards along the ascending colon, while the fingers reach across to the other side, working deeply upon the descending colon and sigmoid flexure, is a very efficient motion in treating for constipation.

The liver may be thoroughly stimulated if, with the patient upon the back and the operator standing beside him, the palms of the operating hands are placed over the seventh, eighth, ninth, and tenth ribs on either side. Now deep pressure, without violence, may be exerted, pressing the ribs down upon the subjacent viscera, while the hands are gradually approximated; thus the blood is pressed out of the vessels in the lower and other viscera, returning as the pressure is relaxed. Repetition of this motion most effectually squeezes the liver. Moreover, this lower costal treatment undoubtedly first excites, then fatigues the diaphragm, relaxing it and freeing all the important structures passing through it: the vena cava, œsophagus, sympathetic nerves, aorta, thoracic duct, etc. This fact would have its bearing upon heart troubles and other affections.

17. In work upon bowel troubles, constipation, etc., the operator should examine particularly the cæcum, sigmoid flexure, and transverse colon.

The sigmoid is readily felt in the left iliac fossa, the upper curve of the "S" lying about even with, or a little below, the anterior superior spine of the ilium. In some patients, especially when the bowel is full, its shape is distinctly felt.

The cæcum lies deeply in the right iliac fossa, and can commonly be made out there if due care is used. It is often made evident by its soft contents, which give it the sense, under the fingers, of a yielding mass. It is found with more difficulty than is the sigmoid flexure.

The transverse colon is usually detected by careful examination at the outer edges of the recti muscles, upon a level with the umbilicus. The examiner must not forget the tendency of the colon to be affected by ptosis, hence must expect often to find it below that point. In such cases one must consider the probability of kinking through dragging at the splenic and hepatic flexures.

In individuals subject to intestinal cramps, or colic, frequently pressure upon the sigmoid, cæcum, ascending, or descending colon, will cause a painful sensation in some other portion of the bowel.

Deep abdominal treatment may be made to stimulate the receptaculum chyli, lymphatic duct, the sympathetic plexuses, the lumbar plexus, and all parts below the diaphragm.

It is a well known fact that the jolting of a wagon or of a railroad train hinders the peristaltic action of the intestines, and may cause constipation. In our treatment for constipation, therefore, care must be taken not to hinder the vermicular intestinal motion by a quick stimulating treatment. A vibratory, stimulating treatment may well be applied in case of diarrhœa.

18. A case is reported in which the patient, sick from an overloaded stomach, was caused to vomit by deep pressure applied between the fourth and fifth ribs on the right side, while the right arm was elevated high above the shoulder.

In a case of a young child, sick from eating too freely of an unsuitable diet, ordinary manipulation of the abdomen caused immediate vomiting.

19. See Appendix, 17.

20. In a certain case of constipation, due to a paralytic state of the bowels accompanying a spinal cord disease in which there was a partial paralysis of the lower limbs, steady treatment for ten months was with but little apparent effect. The bowels never moved without the use of an enema. At times the motion was more free than usual after an enema, and this unusual freedom was attributed to the treatment. Within a month of the time at which treatment ceased, however, the bowels became regular, remaining so for a period of ten days. I have had no further report of the case. Such a result well illustrates the fact so often claimed for Osteopathic treatment, that the upbuilding process is continued by Nature, even after treatment ceases. It is well said that our cures are permanent because they are natural.

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The following index with reference to the particular vertebræ and ribs is added to assist not only in diagnosis but in the treatment of any abnormal conditions found. For example: Should one have a case with a lesion of the 4th dorsal, by consulting the index under that vertebra he would at once be referred to all that has been said in the text as to effects of such a lesion. The same can be said of any one of the vertebræ. In other words, should he not find what he wanted in the regular index this special index would be useful.

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